Engineering

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U. S. DEPARTMENT OF COMMERCE
BUSINESS AND DEFENSE SERVICES ADMINISTRATION
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BIBLIOGRAPHY OF Technical Reports

Vol. 21, No. 4 April 2, 1954

CHEMICALS AND ALLIED PRODUCTS

Drugs and Pharmaceuticals

Coagulation of aerosols. Scientific report no. 2 under Contract AF 19(122)-375, by Frank T. Gucker, Jr. Indiana. University. Dept. of Chemistry, Bloomington, Ind. Jul 1953. 72p drawings, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.50, Photostat $10.00. PB 113001

This report deals with studies, both experimental and theoretical, of the light-scattering properties of aerosols, and with the application of these properties to a study of the process of coagulation in aerosols.

Influence of cortisone on thyroid-pituitary interaction in normal and goitrous rats, by S. A. D'Angelo, C. E. Stevens, K. E. Paschkis, and A. Cantarow. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Oct 1953. 6p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 113084

Cortisone was found to potentiate the effect of propylthiouracil (PTU) on goitrogenesis in rats since (a) thyroid and pituitary enlargement was greater than with goitrogen alone, and (b) the respective changes in TSH levels of blood and pituitary were augmented. Contract no. AF 18(600)-122. AAF SAM Proj 21-1208-0002, Report no. 1.

Plastic dressing (Aeroplast) for burns and surgical wounds, by Daniel S. J. Choy. U. S. Air Force. Air Research and Development Command. Wright Air Development Center. Aero-Medical Laboratory, Wright-Patterson Air Force Base, Dayton, Ohio. Dec 1952. 40p photos, diagr, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. Mimeo: $1.00. PB 111283

Section I is concerned with the treatment of experimental burns on hogs with the plastic dressing and the evaluation of the plastic for possible local and systemic toxicity. Section II deals with studies on comparative wound healing rates in rats, using the plastic dressing and a control dressing of vaseline gauze. Section III describes the clinical trials of the aeroplast dressing on burns and a wide variety of surgical wounds in humans. AAF WADC TR 52-286.

Studies of Alaskan ice fog particles, by William C. Thuman and Elmer Robinson. Stanford Research Institute, Stanford, Calif. Sep 1953. 21p photos, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 112992

Scientific report no. II. Report no. 10 under Contract no. AF 19(122)-634.
1. Aerosols - Analysis 2. Ice crystals - Analysis 3. Fog, Ice - Research 4. SRI Proj CU-473.

Theoretical investigation of the growth of aerosol particles by diffusion. Scientific report no. 3 under Contract no. AF 19(122)-412, by H. L. Frisch and F. C. Collins. Polytechnic Institute of Brooklyn. Dept. of Chemistry. n.d. 10p table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 113003

The effect of the velocity of a freely falling aerosol droplet upon its diffusion-controlled growth rate is evaluated. It is found that the velocity of the droplet in the diffusion field does not significantly accelerate its growth unless the radius of the particle exceeds 10^{-3} cm. Thus it appears that the effect of the gravitation fall of aerosol droplets during their growth from the supersaturated vapor may be safely neglected.

Toxicity and health hazards of boron hydrides, by Eugene H. Krackow. U. S. Chemical Corps. Medical Laboratories, Army Chemical Center, Md. Nov 1951. 10p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 113093

A summary of the more recent toxicity results obtained on diborane, pentaborane, and decaborane. Comments are made regarding detection and protection. Presented at Light Metal Hydrides Meeting, New York City, 7 Sep 1951. CC MD SR 8.

Plastics and Plasticizers

Balloon material specifications: Polyethylene film, by L. W. Sheridan. General Mills, Inc. Engineering Research and Development Dept., Minneapolis, Minn. Aug 1953. 13p photos Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 112994

Contract AF 19(604)-718. Report no. 1222.
1. Balloons - Materials - Specifications 2. Balloons - Materials - Tests 3. Plastics, Polyethylene - Specifications.

Vinyl plastics modified with chemicals from animal fats: Copolymers of vinyl chloride and vinyl stearate, by William S. Port, Edmund F. Jordan, Jr., William E. Palm, Lee P. Witnauer, John E. Hansen and Daniel Swern. U. S. Bureau of Agricultural and Industrial Chemistry. Eastern Regional Research Laboratory, Philadelphia, Pa. Dec 1953. 11p tables Available from U. S. Dept. of Agriculture, Bureau of Agricultural and Industrial Chemistry, Eastern Regional Research Laboratory, Philadelphia 18, Pa. PB 113096

1. Plastics, Vinyl chloride 2. Vinyl chloride - Copolymers 3. Stearic acid, Vinyl ester - Copolymers 4. Fats, Animal - Uses 5. AIC-366.

Paints, Varnishes and Lacquers

Antifouling paint, VI: The role of pigment particle size in the performance of antifouling paint, by J. B. Ballentine, M. O. Yeiter, and A. L. Alexander. U. S. Naval Research Laboratory. Feb 1949. 18p photos, drawing, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 113043

The role of pigment particle size in antifouling paints is studied and a method for classifying a standard pigment sample into fractions of measured particle size is described. Viscosity characteristics imparted by the fine particles are not as severe as heretofore supposed and only initial leaching rate values appear to be enhanced by predominantly small particles of toxic pigment. NRL C-3421.

Preliminary field evaluation of the relative detectability of colors for air-sea rescue, by Florence L. Malone. Nov 1953. 14p col. photo, diagr, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 113106

This study investigated the relative detectability of a series of Munsell reds (10YR to 10R 6/10, 5/10), fluorescent paints, International Orange, and the standard lifeboat yellow, for use in the manufacture of life-saving equipment and survival gear. Color vision report no. 28. Bureau of Medicine and Surgery, Navy Department, Project NM 002 014.09.01. Medical Research Laboratory Report no. 237, Volume XII, no. 22. Color in photo will not reproduce. NAV MRL 237 NMRI Proj NM 002 014.09.01.

Chemical Engineering and Equipment

Chemical engineering education in the United States and in Europe, by Olaf A. Hougen. Wisconsin. Engineering Experiment Station. Jan 1954. 26p photos, diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 113097

1. Chemical engineering - Education 2. Wisconsin. University. Dept. of Chemical Engineering.

Kinetic temperature of wet surfaces, a method of calculating the amount of alcohol required to prevent ice, and the derivation of the psychrometric equation, by J. K. Hardy. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Sep 1945. 13p tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.00. PB 112859

Cover date is 1953. S. O. code no. 23-2830. Report prepared in collaboration with Ames Aeronautical Laboratory and issued as NACA Wartime report A.8.
1. Surfaces - Temperature - Measurement - Gt. Brit. 2. Ice prevention - Gt. Brit. 3. Compounds, De-icing - Gt. Brit. 4. Evaporation - Theory - Gt. Brit. 5. ARC RM 2830.

Miscellaneous Chemicals

Heat conductivity, viscosity, specific heat and Prandtl numbers for thirteen gases, by Frederick G. Keyes. Massachusetts Institute of Technology. Apr 1952. 37p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 113078

Experimental effort is especially directed to obtaining measurements of heat conductivity at temperatures above the upper range of reported data. No measurements to temperatures approaching 1000°C

are given. Results of several years of conductivity measurements for a number of gases are brought together in the form of tables for 13 gases, computed from formulations which include all available information. Data for the first temperature range in the case of the mixture N_2 - CO_2 are also given. Viscosities and specific heats are also included in the tables, all for zero pressure. Project Squid, Technical Report no. 37. Contract N5-ori-07855, NR-090-121/9-14-50 (Phase 2).

Heat flow and diffusion in the chemical reaction of a finite solid with a gas. Part II: Calculation of steady states for the four possible types of reaction, by B. L. Hicks and W. W. Widule. U. S. Aberdeen Proving Ground. Ballistic Research Laboratories, Aberdeen, Md. Jun 1953. 41p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 112911

The results of integrations by hand and on the differential analyzer are collected together for all four possible types of reaction and are presented as plots of the steady state temperature profiles and of the allowed values of the temperature of the center of the reacting slab. Methods are given for quickly determining the stability of each of the steady states. For Part I see PB 108264. Project no. TB 3-0110V of the Research and Development Division, Ordnance Corps. APG BRL R 868.

Improved polysulfide polymers. Report no. 4, annual progress report Nov 15, 1950 to Nov 15, 1951 under Contract no. DA-44-109qm-337, by J. R. Panek, J. A. Gannon, M. B. Berenbaum. Thiokol Corporation, Trenton, N. J. Apr 1952. 90p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.75, Photostat $11.25. PB 112988

1. Copolymers - Evaluation 2. Polymerization, Emulsion - Emulsifying agents 3. Catalysts, Polymerization 4. Thiokol (Trade name).

Isomerism in the Diels-Alder reaction. II: Bromination of Diels-Alder adducts. Annual report under Contract Nonr-567(00) for the period covering Sep 1, 1951 through Sep 1, 1952, by Harold Kwart and Lloyd Kaplan. Delaware. University. Dept. of Chemistry. Sep 1952. 46p diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 113064

The steric course of bromination of the Diels-Alder adducts of cyclopentadiene and maleic anhydride has been examined. Structural assignments are revised to bring all three structures into line with the dipole moment data and with modern concept on the steric course of addition and rearrangement reactions in related bicyclic systems. Contributions from the H. Fletcher Brown Laboratories of the University of Delaware. Presented for publication in the Jour nal of the American Chemical Society. Includes "The configuration of some dichlorocamphanes, by Harold Kwart (AD no. 7577).

Liquid-liquid extraction, a critical survey of the literature dealing with the mechanism of transfer of solutes across phase boundaries with special reference to liquid-liquid interfaces, by J. B. Lewis. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Aug 1953. 24p Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.90. PB 112807

The literature dealing with the theory of mass transfer between two liquid phases is critically examined. The analogous cases of mass transfer in solid-liquid and in gas-liquid systems, and of heat transfer, are also considered. The properties of ions at the interface are reviewed. HD. 986. S. O. code no. 70-674-1-55. AERE CE/R 910. AERE CE/R 600, Rev.

Reaction between nitric oxide and ammonia on supported catalysts, by John R. Kelso. U. S. Aberdeen Proving Ground. Ballistic Research Laboratories, Aberdeen, Md. Jul 1953. 14p diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 112906

The reaction between nitric oxide and ammonia on supported catalysts was investigated. Active catalysts for this reaction may find use in ammonium perchlorate propellants or in igniters. Results obtained to date indicate that oxides of manganese and iron are quite active while vanadium, nickel, and lead oxides and carbon are decreasingly effective in the order given. At low temperatures, some nitrous oxide is formed. Project no. TB 3-0110V of the Research and Development Division, Ordnance Corps. APG BRL MR 699.

Some uses and reactions of lithium aluminum hydride, by Homer W. Carhart, Ronald H. Blizzard, J. Enoch Johnson, and John A. Krynitsky. U. S. Naval Research Laboratory. Feb 1949. 28p diagrs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 112968

A method for the determination of the concentration of lithium aluminum hydride in solution is described. This reagent was used for the determination of the apparent active hydrogen content and certain reducible functional groups of several organic compounds. The hydrogenolysis of several alkyl halides with lithium hydride using lithium aluminum hydride as a hydrogen carrier was accomplished. NRL C 3419.

Zur infrarot-spektroscopie von aminosäuen. I. Mitt.: Eine neue präparationstechnik zur infrarotspektroskopie von aminosäuen und anderen polaren verbindungen (On the infrared spectroscopy of amino acids. Report I: A new technique of preparation for the infrared spectroscopy of amino acids and other polar compounds), by Ulrich Schiedt and Helmuth Reinwein. Translated and edited by F. A. Raven. Oct 1953. 16p drawings, graphs, table

Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 112983t

Translated from Naturforschung vol. 7b, no. 5, May 1952, p. 270-277.
1. Amino acids - Spectroanalysis 2. Spectroscopy, Infrared 3. NAVSHIPS T540 4. STS 176.

ELECTRICAL MACHINERY

Communication Equipment

Approximate solutions of some problems in the theory of ionospheric radio wave propagation, by John M. Kelso. Pennsylvania State College. Radio Propagation Laboratory, State College, Pa. Jun 1949. 156p diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $6.00, Photostat $20.00. PB 113205

AMC Contract no. AF 19(122)-44 (Basic ionospheric research) Technical report no. 2.
1. Radio waves - Propagation - Ionospheric 2. Radio waves - Reflection - Theory 3. Radio waves - Scattering - Theory 4. Ionosphere - Research 5. Mathematical equations and solutions 6. PSC IRL TR 2.

Investigation of an improved conductance measuring circuit at 100 megacycles per second, by W. A. McCool. U. S. Naval Research Laboratory. Jul 1948. 101p photo, diagrs (1 fold), graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.50, Photostat $13.75. PB 113042

An improved circuit, employing a new resonance technique for rapidly measuring very small conductances at low and medium ratio frequencies is described. NRL R 3310.

Measurement of the microwave properties of ferrites at high power levels, by David Levine and John L. Carter. U. S. Camp Evans Signal Laboratory, Belmar, N. J. Nov 1953. 19p diagr, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 112990

An experimental investigation has been made of some of the properties of ferrites at high power levels. Measurements have also been made of the relationship between frequency and the geometry of different samples of ferrite materials. Signal Corps project no. 323B. Dept. of the Army project no. 3-19-03-032. MON-210-53. SCEL TM M-1544.

Radio interference suppression techniques, a guide for manufacturers. U. S. Camp Coles Signal Laboratory. Suppression and General Engineering Branch, Fort Monmouth, N. J. Nov 1953. 267p photos, diagrs, drawings, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $9.00, Photostat $33.75. PB 112862

Contract DA-36-039-sc-42596.
1. Radio interference - Elimination 2. Ratio interference - Measurement 3. Radio interference - Tests 4. Radio interference - Theory 5. SIG Contract DA36-039-sc-42596.

Electronics

Electronic equipment reliability program. Preliminary report under Contract NObsr-52215, by J. C. Geist. Kellex Corporation. Silver Spring Laboratory, Silver Spring, Md. Feb 1951. 17p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 113072

Technical report no. 18. For other reports under this Contract see PB 113073-113076.
1. Electronic equipment - Failure.

Engineering study of a proposed U. S. Navy electronic reliability handbook. Vitro Corporation of America. Silver Spring Laboratory, Silver Spring, Md. Aug 1952. 46p tables (1 fold) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 113075

Contract NObsr 52215. Technical report no. 41. For other reports under this Contract see PB 113072-113074, 113076.
1. Electronic equipment - Handbooks.

Parts failure analysis, electronic equipment reliability program. Vitro Corporation of America. Silver Spring Laboratory, Silver Spring, Md. Nov 1951. 49p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 113073

Technical report no. 25. Contract NObsr 52215. For other reports under this Contract see PB 113072, 113074-113076.
1. Electronic equipment - Failure.

Interaction between two electron streams for microwave amplification, by Charles K. Birdsall. Stanford University. Electronics Research Laboratory, Stanford, Calif. Jun 1951. 172p photos, diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $6.50, Photostat $22.50. PB 113047

A physical basis for growing waves is presented along with several series of curves which may be used to obtain the gain of an actual tube. The electromechanical interaction of two streams of charge is qualitatively described. Contract N6onr-251, consolidated task no. 7 (NR-078-360). SU ERL TR 36.

Research in physical electronics. Illinois. Engineering Experiment Station, Urbana, Ill. Electrical Engineering Research Laboratory. Electron Tube Research Section. Quarterly report no. 3 under Contract no. AF 19(604)-524, for the period 15 Mar 1953 to 15 June 1953, approved by Paul D. Coleman, Ladislas Goldstein, Heinz von Foerster. Jul 1953. 166p photos, diagrs, graphs (part fold), tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $6.25, Photostat $21.25. PB 112885

1. Electronics - Research 2. Kerr cell (Photoelectric cell) 3. Transmitters, Pulse 4. Plasma, Electron - Oscillations 5. Radio waves - Propagation 6. Waves, Electromagnetic - Generation.

Services, facilities and materials for performance evaluation of existing types of fixed resistors in the ultra high frequency spectrum. International Resistance Co., Philadelphia, Pa. Under Contract no. W36-039-sc-44526. Order separate parts described below from Library of Congress, Publication Board Project, Washington 25, D. C., giving PB number of each part ordered.

Report no. 19A. Interim report, 1 June 1949 to 22 Mar 1951. Part I: Development of methods for measuring high frequency characteristics of fixed composition resistors from DC to 400 megacycles, prepared at University of Pennsylvania, Moore School of Electrical Engineering, by Ralph M. Showers and at International Resistance Co., by Esmond E. Johnson. Mar 1951. 45p fold drawings, diagrs, graphs, tables Microfilm $2.50, Photostat $6.25. PB 113107

1. Resistors, Fixed - High megohm 2. Resistance, High frequency - Measurements 3. Instruments, Measuring - Resistance 4. Frequency measurements - Methods 5. Pennsylvania. University. Moore School of Electrical Engineering.

Report no. 19A. Interim report, 1 June 1949 to 22 Mar 1951. Part II: Measuring high frequency characteristics of fixed composition resistors from DC to 400 megacycles, by Esmond E. Johnson. Mar 1951. 191p photos, graphs, tables Microfilm $7.00, Photostat $25.00. PB 113108

1. Resistors, Fixed - High megohm 2. Resistance, High frequency - Measurements 3. Instruments, Measuring - Resistance 4. Frequency measurements - Methods.

Final report, 1 June 1949 to 22 Mar 1953. Part III: Development of a line of fixed, non-wire wound resistors for use in semi-automatic precision high frequency circuit applications at frequencies from 0 to 400 megacycles, by Charles L. Wellard, Willis W. Littleton, Edward E. Thompson. Mar 1953. 45p drawings, graphs, tables Microfilm $2.50, Photostat $16.25. PB 113109

1. Resistors, Fixed - Design 2. Resistance, High frequency - Measurements.

Final report, 1 Jun 1949 to 22 Mar 1953. Part III, supplement: Development of a line of fixed, non-wire wound resistors for use in semi-automatic precision high frequency circuit applications at frequencies from 0 to 400 megacycles, by Charles L. Wellard, Willis W. Littleton, Edward E. Thompson. Mar 1953. 22p drawings (part fold) Microfilm $2.00, Photostat $3.75. PB 113109s

Space charge waves in an accelerated electron stream for amplification of microwave signals, by Ping King Tien and Lester M. Field. Stanford University. Electronics Research Laboratory, Stanford, Calif. May 1951. 68p photos, diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.00, Photostat $8.75. PB 113046

Space charge waves in an accelerated or decelerated electron stream are studied in this paper using a one-dimensional small-signal approximation. Exact solutions are given for an idealized stream of infinite extent, accelerated or decelerated uniformly through a space where d.c. space charge effects are assumed to be neutralized by positive ions. Contract N6onr-251, consolidated task no. 7 (NR-078-360). SU ERL TR 35.

Studies of detectability during continuous visual search, by James Deese and Elizabeth Ormond. Johns Hopkins University. Sep 1953. 55p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photostat $7.50. PB 113110

The task employed in these experiments was a search for isolated targets that appeared from time to time on a single sweep of a PPI-type cathode ray tube. A number of variables were studied, of which perhaps the most significant is the rate at which targets appear. Probability of detection was studied for different average rates of target appearance. Contract AF 33(038)-22642. AAF WADC TR 53-8.

Summary report, electronic equipment reliability program. Vitro Corporation of America. Silver Spring Laboratory, Silver Spring, Md. Mar 1953. 35p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 113076

Technical report no. 45. Contract NObsr 52215. For other reports under this Contract see PB 113072-113075.
1. Electronic equipment - Failure.

Generators, Motors, Transmission

Average pulse relationships in high pulse density systems, by Gunnar P. Ohman. U. S. Naval Research Laboratory. Nov 1948. 54p diagrs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photostat $7.50. PB 113037

Average or probable relationships between pulses arriving from large number of sources are found and formulas are given for such quantities as average duty factor, probable number of nonover-lapped pulses, average number of nonoverlapped pulse fronts, and probable resultant pulse length distribution. Problem of gating is considered and formulas are given which indicate gating efficiency under various conditions of operation. NRL R-3379.

Graphical analysis of transistor binaries, by Emery A. White. U. S. Aberdeen Proving Ground. Ballistic Research Laboratories, Aberdeen, Md. Aug 1953. 25p diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 112903

A method of graphical analysis is described that is applicable to both single - and two-transistor binaries. The method is more accurate than conventional analytical methods and less time-consuming than known graphical methods. Project no. TB 3-0538 of the Research and Development Division, Ordnance Corps. APG BRL MR 706.

Improved two transistor binary circuit, by Emery A. White. U. S. Aberdeen Proving Ground. Ballistic Research Laboratories, Aberdeen, Md. May 1953. 36p diagrs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 112902

The improved circuit extends the response of the binary to repetition rates well beyond those usable in conventional two-transistor binary circuits. The performance of the conventional circuit and the developmental circuit are compared. Factors affecting transistor stability are discussed. An explicit relationship is derived between the maximum external capacity that will permit stability and the frequency response of the transistor. Project no. TB 3-0538 of the Research and Development Division, Ordnance Corps. APG BRL MR 690.

Multiple pulse generator, by J. P. Sheridan. U. S. Naval Research Laboratory. Oct 1948. 21p photos, diagrs (2 fold) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 112961

Design of a pulse generator capable of simulating interrogations of from 1 to 300 separate and independent sources through a single output channel, such as might be received from a number of aircraft. It is expected to aid (a) the study of pulse behavior during periods of high pulse densities, and (b) the development of new types of pulse operated equipments (homing beacons, identification transponders, telemetering, modulation systems, etc.). NRL R-3372.

Noise reduction in beam type amplifiers, by Dean A. Watkins. Stanford University. Electronics Research Laboratory, Stanford, Calif. Mar 1951. 135p photos, drawings, diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $5.50, Photostat $17.50. PB 113041

A theory of shot noise in microwave beam type amplifiers is derived. The dependence of traveling-wave tube noise figure upon degree of space-charge, circuit loss, and circuit position is presented in a series of curves. Some of the limitations and approximations of the noise theory are considered in detail. The importance of partition noise is discussed together with a description of several practical amplifiers. Designs are given for 3000 mc. traveling-wave amplifiers which have gains of 10 to 20 db. and noise figures of 10 to 12 db. Contract N6-onr-251, consolidated task no. 7 (NR-078-360). SU ERL TR 31.

Non-linear effects in velocity modulated beams, by J. L. Putz. Stanford University. Electronics Research Laboratory, Stanford, Calif. Mar 1951. 38p graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 113045

An extension of the simple small signal theory of bunching in velocity modulated beams to include multifrequency bunching and large signal effects shows that the non-linear action of a klystron type amplifier is very similar to that of a conventional multigrid tube at low frequencies. A simple expression for the "transfer characteristic" of a klystron is presented. Contract N6onr-251, consolidated task no. 7 (NR-078-360). SU ERL TR 33.

Non-linear phenomena in traveling-wave amplifiers, by John L. Putz. Stanford University. Electronics Research Laboratory, Stanford, Calif. Oct 1951. 83p graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.75, Photostat $11.25. PB 113048

Some experimental results are presented which appear to verify the theory of harmonic frequency generation and cross-modulation effects. Contract N6onr-251, consolidated task no. 7 (NR-078-360). SU ERL TR 37.

Radio transmitter, receiver and recording systems for constant level balloons, by Philip Greenstein. New York University. College of Engineering. Research Division. Jun 1948. 26p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 113122

Project no. 93, Final report no. 93.17. Contract W28-099-ac-241.
1. Telemetering, Radio 2. Transmitters, Telemetering - Design 3. Balloons, Meteorological - Transmitters.

Some general properties of non-linear amplifiers, by J. L. Putz. Stanford University. Electronics Research Laboratory, Stanford, Calif. Mar 1951. 33p table Available from Library of Congress,

Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 113044

A theoretical study of the properties of non-linear amplifiers reveals that there are certain definite relationships between the putput at a single frequency and the small-signal cross-modulation effects which appear when two frequencies are present at the input. These relationships are found to be common to all amplifiers regardless of type. Contract N6onr-251, consolidated task no. 7 (NR-078-360). SU ERL TR 32.

Standard white noise generator, by Gerard Lynch. U. S. Camp Coles Signal Laboratory, Fort Monmouth, N. J. Jul 1953. 21p photos, drawings, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 112863

Design data and complete drawings are included in this report. A detailed explanation is given for its use as a measurement standard in the calibration of noise figure measuring sets. Dept. of the Army project no. 3-99-12-021. Signal Corps project no. 132A. SCEL ER E-1123.

Waveform generator, by R. J. Harron. Canada. National Aeronautical Establishment. Oct 1953. 24p photos, diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. Available for exchange from National Aeronautical Establishment, Montreal Road, Ottawa, Canada. PB 112989

The instrument described in this report is capable of generating any desired waveform at recurrent frequencies between two and seventy cycles per second. An outline of the desired waveform is cut from a sheet of opaque material and inserted in a slot located between a phototube and a cathode-ray tube. The output voltage is dependent on the height of the waveform mask, and reaches a maximum of eighty volts peak to peak across an internal impedance of ten thousand ohms. NAEC LR-80.

Miscellaneous

Analysis of antenna wavefronts, by Kenneth S. Kelleher. U. S. Naval Research Laboratory. Jul 1948. 24p diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 113039

Investigation of wavefront produced by line source parallel to elements of a general cylindrical surface. The wavefront in planes perpendicular to line source is obtained in parametric form in terms of the reflector curve and the position of the source. For parabolic reflecting curve, optimum off-axis source position is considered, connection between source position and direction of propagation is established and application of wavefronts to radiation characteristics is developed. NRL R-3329.

Arbitrarily polarized antenna for use at K-band: Installation, operating, maintenance instructions and final report for period May 10, 1950 to July 14, 1951 under Contract no. AF 19(122)-233, by H. J. Riblet. Microwave Development Laboratories, Inc., Waltham, Mass. Jul 1951. 38p photos, drawings (part fold), graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 113123

1. Antennas, Radar - Design 2. Antennas, Radar - Maintenance and repair 3. Radar - Bands K.

Description and use of electron micrometer tube, type C796C, by T. B. Fryer. U. S. Naval Research Laboratory. Jul 1948. 12p drawings, diagrs, graphs, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 113038

This report gives circuits and typical performance data for the electron micrometer tube. The advantages and disadvantages of various circuits are considered, and three typical circuit diagrams are presented. Data are also given on the expected performance of electron micrometer tubes with respect to linearity, sensitivity, and stability. NRL F-3315.

Development of turntable, radar set MT-1173 (XW-1)/FPN (a rotating base for precision approach radar), by D. R. Kirshner. U. S. Air Force. Air Research and Development Command. Rome Air Development Center, Griffiss Air Force Base, Rome, N. Y. Dec 1953. 88p photos, drawings (1 fold), graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.75, Photostat $11.25. PB 113119

The operational background, evolution, development engineering, field installation and flight tests of "Turntable, Radar Set MT-1173(XW-1)/FPN," the engineering model of a rotating understructure for Radar Set AN/FPN-16, are described. AAF RADC TR 53-2.

Dual-channel rotary joint for 1250 Mc, by Martin J. Votaw. U. S. Naval Research Laboratory. Jan 1954. 7p drawings, diagrs, graph Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 113092

A dual-channel rotary joint has been developed for airborne radar use. Each channel operates on the same frequency, 1250 ± 30 Mc. A two-section arrangement of chokes provides isolation between channels and electrical continuity between stationary and rotating sections of the joint. The VSWR is less than 1.09 from 1220 to 1280 Mc, the isolation between channels exceeds 85 db, and the joint meets the mechanical requirements of Specifications AN-E-19. NRL R-4270.

Exploration of numerical filtering techniques, by John T. Fleck and William D. Fryer. Cornell

Aeronautical Laboratory, Inc., Buffalo, N. Y. May 1953. 82p diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.75, Photostat $11.25. PB 112918

Numerical filtering is introduced as a method for extending to arithmetic or digital processes the familiar frequency domain approach of electrical filter theory. For a given linear operation on numerical data in the time domain, the corresponding effect in the frequency domain can be obtained in the form of a filter "transfer function," the term being equivalent in meaning to the transfer function of an electrical filter. Synthesis procedures utilizing the filter concept are capable of generating the classical formulae for numerical operations, and with simple modification can be made to account for noise in the data. CAL XA-869-P-1.

Frequenzmessung hoher genauigkiet (High precision frequency measurement), by Karlheinz Gosslau. Translated and edited by F. A. Raven. Oct 1953. 22p photo, diagrs, graph, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 112984t

Translated from Frequenz, vol. 6, no. 9, 1952, p. 249-255.
1. Frequency measurements - Methods - Germany 2. Siemens & Halske A. G., Berlin 3. NAVSHIPS T541 4. STS 173.

Progress report for July-Sep 1953. National Research Council of Canada. Radio and Electrical Engineering Division. Oct 1953. 33p photos, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. Limited supply available free from Radio and Electrical Engineering Document Office, National Research Council, Ottawa, Canada. PB 112976

1. Dielectric research - Canada 2. Electromedical research - Canada 3. Navigational aids - Canada 4. Radar - Research - Canada 5. Engineering, Electrical - Research - Canada 6. Tubes, Electron - Research - Canada 7. NRCC ERA-258.

Radiation of a Hertzian dipole over a coated conductor, by Donald B. Brick. Harvard University. Cruft Laboratory. May 1953. 82p diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.75, Photostat $11.25. PB 112917

Formulas are derived and illustrated with numerical examples of the radiation resistances of the dipoles and the attenuation constants of the surface modes due to finite conductivity of the ground plane. Contract N5ori-76, Task order no. 1, NR-078-011. HU CL TR 172.

Response to pulse loading of a single degree of freedom non-linear system, by James F. Bell and William G. Soper. Sep 1953. 27p photos, diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 112915

Contract DA36-034-ORD-885 RD.
1. Transient electrical phenomena - Measurement 2. Electric systems, Non-linear - Computing methods 3. Johns Hopkins University. Dept. of Mechanical Engineering.

Survey of test requirements and procedures in component-part specifications, electronic equipment reliability program. Vitro Corporation of America. Silver Spring Laboratory, Silver Spring, Md. Feb 1952. 58p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photostat $7.50. PB 113074

Technical report no. 32. Contract NObsr 52215.
1. Electronic equipment - Failure 2. Electronic equipment - Components - Tests.

FUELS AND LUBRICANTS

Development of qualification test methods for gear lubricants. Armour Research Foundation, Chicago, Ill. Under Contract no. DA11-022-ORD-905. Order separate parts described below from Library of Congress, Publication Board Project, Washington 25, D. C., giving PB number of each part ordered.

Progress report no. 13, Jul 15, 1953 to Aug 15, 1953, by M. J. Ramirez. Aug 1953. 6p Microfilm $1.25, Photostat $1.25. PB 112998

For reports no. 1-12, see PB 107585, 107682, 107893, 109777-109778, 109784-109785, 109924, 110878.
1. Gears - Lubrication 2. Lubrication - Testing equipment 3. ARF Proj L030-9, Report no. 13.

Progress report no. 14, Aug 15, 1953 to Sep 15, 1953, by M. J. Ramirez. Sep 1953. 8p photos Microfilm $1.25, Photostat $1.25. PB 112997

For reports no. 1-12, see PB 107585, 107682, 107893, 109777-109778, 109784-109785, 109924, 110878.
1. Gears - Lubrication 2. Lubrication - Testing equipment 3. ARF Proj L030-9, Report no. 14.

Progress report no. 15, Sep 15, 1953 to Oct 15, 1953, by M. J. Ramirez. Oct 1953. 3p Microfilm $1.25, Photostat $1.25. PB 112996

For reports no. 1-12, see PB 107585, 107682, 107893, 109777-109778, 109784-109785, 109924, 110878.
1. Gears - Lubrication 2. ARF Proj L030-9, Report no. 15.

Progress report no. 16, Oct 15, 1953 to Nov 15, 1953, by H. Ruwe Barton. Nov 1953. 9p tables Microfilm $1.25, Photostat $1.25. PB 112995

For reports no. 1-12, see PB 107585, 107682, 107893, 109777-109778, 109784-109785, 109924, 110878.
1. Gears - Lubrication 2. Lubrication - Testing equipment 3. ARF Proj L030-9, Report no. 16.

Ecoulement radial d'un fluide visqueux entre deux disques tres rapproches; theorie du palier a air (Radial flow of a viscous fluid between two disks very close together; theory of the thrust bearing with air as lubricant), by E. A. Deuker and H. Wojtech. Translated by L. C. Stevens, edited by F. A. Raven. Nov 1953. 41p diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 112987t

Translated from Revue generale de l'hydraulique, no. 65-66, 1951, part I, sec. 1-3: p. 227-234, part I, sec. 4 and part II: p. 285-294. Report of research at the Laboratory of Aerodynamic and Ballistic Research, Vernon, France.
1. Bearings, Thrust - Lubrication - Theory - France 2. Lubricants - Air - France 3. Flow, Compressible - Theory - France 4. Flow, Incompressible - Theory - France 5. NAVSHIPS T546 6. STS 181.

Lubricants of reduced flammability, by Charles E. Frank, Donald E. Swarts and Kenneth T. Mecklenborg. U. S. National Advisory Committee for Aeronautics. Jan 1954. 24p graphs, tables Available from National Advisory Committee for Aeronuatics, 1724 "F" St., N. W., Washington 25, D. C. PB 112981

Determination of the change in spontaneous ignition temperature with composition for blends of hydrogenated polyisobutylene with typical ester, hydrocarbon, and polyether lubricants has shown that 40 percent hydrogenated polyisobutylene by volume raises the ignition temperature of these lubricants by 60° to 80° C. A practical method for synthesizing polyisobutylene largely in the lubricant molecular weight range has been developed. NACA TN 3117.

Oil-shale operations in the Union of South Africa, October 1947, by H. M. Thorne and A. J. Kraemer. U. S. Bureau of Mines. Jan 1954. 52p photos, maps, fold drawings, diagrs, tables Available from U. S. Bureau of Mines, 4800 Forbes St., Pittsburgh 13, Pa. PB 112860

1. Oil shales - Union of South Africa 2. Oil shales - Plants - Union of South Africa 3. BM RI 5019.

Tallol investigations, by Frank C. Vilbrandt and others. Virginia. Engineering Experiment Station, Blacksburg, Va. Nov 1953. 14p Available from Engineering Experiment Station, Virginia Polytechnic Institute, Blacksburg, Va. $.25. PB 112880

Bulletin of the Virginia Polytechnic Institute, vol. XLVII, no. 1.
1. Talloil - Refining 2. Talloil - Esterification 3. Talloil - Uses 4. V EES 89.

HIGHWAYS AND BRIDGES

Bituminous surfacings made by the wet-aggregate (hydrated lime) process. Gt. Brit. Dept. of Scientific and Industrial Research. Road Research Laboratory, Harmondsworth, England. 1953. 20p photo, diagrs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.30. PB 112846

S. O. code no. 47-141-16.
1. Roads - Surface treatment - Bituminous materials - Gt. Brit. 2. Aggregates, Lime - Compaction - Gt. Brit. 3. DSIR RRL RN 16.

Flexible-pavement design. Highway Research Board. 1953. 18p tables Available from Highway Research Board, 2101 Constitution Ave., N. W., Washington 25, D. C. $.30. PB 112881

1. Pavements, Flexible - Design 2. NRC 282 3. HRB Bul 80.

Mechanization of roadside operations, a summary of the reports on equipment for roadside operations by a special project committee of the Committee on Roadside Development, Wilbur J. Garmhausen, Chairman. 1953. 39p photos Available from Highway Research Board, 2101 Constitution Ave., N. W., Washington 25, D. C. $.60. PB 113091

1. Roads - Roadside development - Equipment 2. Roads - Construction 3. HRB SR 16 4. NRC 289.

Proceedings. Northwest Conference on Road Building, 1953. Jul 1953. 116p photos, diagr, graphs Available from Oregon State Engineering Experiment Station, Corvallis, Ore. $.60. PB 113081

Contents: I. Welcome, by George W. Gleeson. - II. Why do specifications contain certain provisions? by G. W. Harra. - III. Source and selection of mineral aggregates, by Lewis E. Scott. - IV. Application of precast and prestressed concrete to county and city structures, by Roy C. Edgerton. - V. Choosing street lighting for your specific problem, by Stacy Standley. - VI. U. S. Geological Survey cooperative hydrologic programs in various states, related to highway bridge and culver waterway design, by Fred M. Veatch. - VII. Hydrology in design of bridge waterways, by G. L. Bodhaine. - VIII. Hydraulic model studies, by Leslie A. Clayton. - IX. Box culvert design by hydraulic model study, by R. H. Shoemaker. - X. Emulsified asphalt base treatment, by Clifford M. Wimberly. - XI. Review and comparison of stability test methods for asphalt paving mixtures, by V. R. Smith. - XII. Controlling the clay content in highway materials, with

appendix: Test procedure, sand equivalent test, by F. N. Hveem. - XIII. Control of landslides, by R. G. Hennes. - XIV. What are good public relations? by Oren L. King. - XV. Advisory committee. - XVI. Registration roster.
1. Roads - Construction 2. Aggregates, Mineral 3. Street lighting 4. Bridges - Design 5. Pavements, Asphalt 6. Pavements, Concrete 7. Landslides - Control 8. O EES C 17.

Retention of cover stone by asphalt surface treatments, by Fred J. Benson and Bob M. Gallaway. Texas. Engineering Experiment Station, College Station, Texas. Sep 1953. 64p photos, drawings, graphs, tables Available from Texas Engineering Experiment Station, Texas A. and M. College System, College Station, Texas. PB 112977

1. Roads - Surface treatment 2. Aggregates, Cement-bonded 3. Pavements, Concrete - Asphaltic 4. T EES B133.

Roadside development. Report of committee on roadside development. Presented at the thirty-second annual meeting. Highway Research Board. 1953. 84p photos, drawings, graphs, tables Available from Highway Research Board, 2101 Constitution Ave., N. W., Washington 25, D. C. $1.35. PB 113115

National Research Council publication 286. Contents: Report of the Committee on roadside development, by Harold J. Neale. - Symposium on "Roadside - their use and protection," by David R. Levin. - Report of project committee on stabilized turf shoulders, by Harry H. Iurka. - Influence of soil mixtures on turf growth and soil stability for highway shoulders and airports, by G. C. Blomquist. - Report of project committee on planning and management of roadside vegetation, by Nelson M. Wells. - Results of roadside tests with soil conditioners in 1952, by John Monteith, Jr. - Report on use of maleic hydrazide for temporary growth inhibition of grass, by John W. Zukel. - Roadside litter - its clean-up, cost and cure, by John L. Wright. - Pruning highway trees, report of project committee on roadside tree techniques, by Rush P. Marshall. - Report of project committee on mechanization of roadside operations, by Wilbur J. Garmhausen. - Report of project committee on publications, by Olive E. Potter. - Supplementary report made at closing business meeting, January 16, 1953 on publications program for 1953. - Appendix A: Overseeding tests in the National Capital parks, by John Monteith, Jr. - Appendix B: Register of attendance at 1953 meetings of Committee on Roadside development, Highway Research Board. - Appendix C: Coordinators of the committee on roadside development.
1. Roads - Roadside development 2. Roads - Roadside development - Equipment 3. Turf - Growth 4. Trees - Pruning 5. Trees - Growth regulators 6. Parks - Overseeding 7. Embankments, Road - Compaction 8. Soil stabilization 9. NRC 286.

Salt treatment of snow and ice on roads. Gt. Brit. Dept. of Scientific and Industrial Research. Road Research Laboratory, Harmondsworth, England. 1953. 8p graph, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.15. PB 112845

Supersedes Road note no. 2 (PB 92692).
1. Snow - Melting - Gt. Brit. 2. Ice - Melting - Gt. Brit. 3. Salt solutions - Effect on ice and snow - Gt. Brit. 4. Roads, Icy - Treatment - Gt. Brit. 5. DSIR RRL RN 18.

Tar-rubber test section at Waterways Experiment Station. Report no. 1: Design and construction of test section. U. S. Waterways Experiment Station, Vicksburg, Miss. Nov 1953. 73p photos, diagr, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.50, Photostat $10.00. PB 113004

1. Pavements, Flexible - Tests 2. Airports - Pavements - Tests 3. WES TM 3-372.

INSTRUMENTS

Cathode-ray tuning monitor for frequency-shift reception, by Willard C. Whitmer. U. S. Naval Research Laboratory. Oct 1948. 14p photos, diagrs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 113033

The desirable characteristics of a tuning monitor for frequency-shift communication-receiving equipments are analyzed and the development of a suitable electronic system, including the design parameters of a special adaptor for use between the OSA or larger oscilloscopes, and either the FRA or FRG frequency-shift converter, is covered in detail. NRL R 3373.

Design and operation of digital calculating machinery. Harvard University. Computation Laboratory. Under Contract AF 33(038)-9461. Order separate parts described below from Library of Congress, Publication Board Project, Washington 25, D. C., giving PB number of each part ordered.

Progress report no. 22 covering period 10 Feb 1952-10 May 1952, by Holly Wilkins, Hydron Huxtable, and Robert Burns. May 1952. 183p photos, diagrs, graphs, tables Microfilm $6.75, Photostat $23.75. PB 112972

Contents: I. Photography on the progress of Mark IV and a summary on testing of Mark IV. - II. Final report on functions for Mark IV, by Orten Gadd and Peter Strong. - III. Relay-timed pulse generator, by Richard Hofheimer. - IV. Mark IV multiplier, by Charles Coolidge. - V. Fundamental principles of ferro-resonance, by Jose Santesmases. - VI. Computation services, by Theodore Singer. - VII. Report on methods and solutions of Air Force problems on Mark I calculator: Problem report no. 35. Computations of field patterns for the

Wullenweber array (AF problem no. 50), by Davis Beckwith.
1. Computers, Digital - Design 2. Computers, Digital - Components 3. Mark IV (Computer) 4. Generators, Pulse - Design 5. Resonance, Ferromagnetic 6. Wullenweber array - Radiation patterns - Calculation.

Progress report no. 23, covering period 10 May 1952-10 Aug 1952, by Robert Burns and Kenneth Iverson. Aug 1952. 154p photos, tables Microfilm $6.00, Photostat $20.00. PB 112922

Pt. V. is Tabulation of boundary layer functions for a cylinder (AF problem 67), by Edward Seligman and Warren Semon (Problem report no. 36) and Automatic design of triplet lenses (AF problem 68) by Ivan King (Problem report no. 37).
1. Computers, Digital - Design 2. Computers, Digital - Coding 3. Computers, Digital - Optical elements 4. Mark IV (Computer) 5. Boundary layer - Tables.

Progress report no. 24, covering period 10 Aug 1952-10 Nov 1952, by Robert Burns. Nov 1952. 228p drawings, diagrs, tables Microfilm $8.00, Photostat $28.75. PB 112921

Contents: I. Mark IV divider, by Kenneth Perry. - II. Computation services. - III. Coefficients for interpolation in the Bessel function of orders zero and one in the complex plane (AF problem no. 52). Problem report no. 38. - Tracing of skew rays through an optical lens design (AF problem no. 73), by Ivan King. Problem report no. 39.

Progress report no. 26, covering period 10 Nov 1952-10 Feb 1953, by Robert Burns, Jacquelin Sanborn, and Carmela Ciampa. Feb 1953. 147p graphs, tables Microfilm $5.75, Photostat $18.75. PB 112971

Contents: I. Computation services. Bar graph of Mark IV operation, Aug 18-Dec 31, 1952. - II. Report on methods and solutions of Air Force problems: Problem report no. 40. Tilt determination of aerial photographs (AF problem 69), by Alfred Vassalotti and Mark Pivovonsky. - III. Problem report no. 41. Radiation pattern functions (AF problem 80), by Clarence Ross. - IV. Problem report no. 43. Kinetic structure of plane shock waves (AF problem 54), by David Beckwith. - V. Problem report no. 42. Ambipolar diffusion (AF problem 81), by Robert Minnick.- VI. Problem report no. 44. Discussion of a set of rational functions to be integrated, by Gerard Salton. - VII. Problem report no. 45. Radar scatter problem (AF problem 70), by Theodore Singer. - VIII. Study for the design of an automatic dictionary, by Anthony Oettinger. - IX. Brief summary of Mark I relay multiplier, by Warren Semon.
1. Computers, Digital - Design 2. Mathematical equations and solutions 3. Tables, Mathematical 4. Photography, Aerial - Tilt - Calculation 5. Shock waves - Computation 6. Diffusion theory 7. Radio waves - Scattering 8. Multipliers, Decimal - Design 9. Dictionaries, Automatic.

Electrical resistance changes in fine wires during plastic and elastic elongation, by E. W. Kammer and T. E. Pardue. U. S. Naval Research Laboratory. Oct 1948. 22p diagr, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 113035

Variation of resistance and stress with respect to strain are displayed graphically, and a description of the test apparatus is included. Strain sensitivity in both the plastic and elastic ranges has been ascertained from the slope of the resistance-strain curve. Investigation covers elements iron, nickel, and platinum, as well as fifteen alloys readily available in the form of fine wires. NRL F-3363.

Hermetically sealed, high temperature variable film type resistors. Final report under Contract no. DA36-039-sc-77, period 27 April 1950 to 27 April 1953, by Lawrence B. Krauss and Irving G. Patterson. Fairchild Camera and Instrument Corp., Hicksville, Long Island, N. Y. Apr 1953. 57p photos, drawings Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photostat $7.50. PB 113013

Report 1074. Dept. of the Army Project no. 3-26-00-600. Signal Corps Project no. 32-2006-31.
1. Resistors, Hermetically sealed - High temperature 2. Resistors, Variable 3. Resistors, Nonlinear - Coatings 4. Films (Photography), Resistance control - Coatings 5. Potentiometers - Materials 6. SIG Contract DA36-039-sc-77, Final report.

High-resolution high-intensity-scintillation detector, by W. C. Hall, B. M. Horton, J. W. Keller and S. H. Liebson. U. S. Naval Research Laboratory. Jan 1952. 8p photos, drawing, diagrs, graphs, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. Mimeo: $.50. PB 111281

A scintillation detector consisting of a large coaxial phototube with an opaque photocathode as center conductor and a mesh-type anode as outer conductor has been designed to detect high-intensity nuclear radiation with good time resolution. The design is based on a mathematical analysis of the light-generating and absorbing properties of the scintillating material contained in the sleeve surrounding the phototube and of the sensitivity, dimensions, and limitations of the phototube itself. NRL R 3927.

Investigations for design of digital calculating machinery. Harvard University. Computation Laboratory. Under Contract W19-122-ac-24. Order separate parts described below from Library of Congress, Publication Board Project, Washington 25, D. C., giving PB number of each part ordered.

Progress report no. 1 covering period May 10, 1948-Aug 10, 1948. Aug 1948. 17p photos, diagr Microfilm $1.75, Photostat $2.50. PB 112924

Contents: I. Dynamic magnetic recording, by Eugene Grant, John Rothery, Peter Lindley. - II. Static magnetic recording, by Howard Aiken, An Wang, Wag Dong Woo. - III. Logical design of vacuum tube control circuits, by William Burkhart and Theodore Kalin.
1. Computers, Digital - Design 2. Recorders, Magnetic - Design 3. Recording, Magnetic - Theory 4. Circuits, Control - Design.

Progress report no. 2, covering period Aug 10, 1948-Nov 10, 1948. Nov 1948. 109p drawing, diagrs, graphs, tables Microfilm $4.50, Photostat $13.75. PB 112923

Contents: I. Instruction in applied mathematics with special reference to automatic calculating machinery. - II. Dynamic magnetic recording, by Eugene Grant and Peter Lindley. - III. Dynamic magnetic recording process, theory, by John Rothery. - IV. Static magnetic storage, by An Wang. - V. Logical design of vacuum tube circuits for computing machinery, by Howard Alken, William Burkhart, Theodore Kalin.
1. Computers, Digital - Design 2. Computers, Digital - Circuits 3. Recording, Magnetic - Theory 4. Circuits, Control - Design 5. Data storage systems.

Progress report no. 3, covering period Nov 10, 1948-Feb 10, 1949, by Peter Lindley and Martha Whitehouse. Feb 1949. 251p photos, drawings, diagrs, graphs, tables Microfilm $9.00, Photostat $32.50. PB 112925

Contents: I. Instruction in applied mathematics with special reference to automatic calculating machinery. - II. Dynamic magnetic recording, by Peter Lindley. - III. Accurately timed master pulses, by Eugene Grant. - IV. Magnetic recording theory, by John Rothery. - V. Static magnetic storage and delay line, by An Wang. - VI. Solid tubes for computers: Ferromagnetic and semi-conducting controls to replace vacuum tubes in automatic calculating machines, by Miles Hayes. - VII. Design for bulk storage, by Eugene Grant, Elbert Little, Dexter Smith, Robert Wilkens. - VIII. Logical design of vacuum tube circuits for computing machinery (continued from Progress report no. 2, part V, sec. 3) by Howard Aiken, William Burkhart, Theodore Kalin. - IX. Table: Minimal vacuum tube operators for the switching functions of four variables.
1. Computers, Digital - Design 2. Computers, Digital - Controls 3. Computers, Digital - Circuits - Design 4. Recording, Magnetic - Theory 5. Pulse timing 6. Data storage systems.

Progress report no. 4, covering period Feb 10, 1949-May 10, 1949, by Peter Lindley and Martha Whitehouse. May 1949. 168f photos, drawings, diagrs, graphs, tables Microfilm $6.25, Enlargement Print $22.50. PB 112973

Contents: I. Computation service. - II. Logical design of vacuum tube circuits for computing machines (continued) by Howard Aiken, Theodore Kalin, and William Burkhart. - III. Dynamic magnetic recordings, by Peter Lindley and Way Dong Woo. - IV. Magnetic trigger circuit, by John Rothery. - V. Static magnetic storage and delay line, by Miles Hayes. - VI. Static magnetic delay line construction and application, by Robert Wilkins and Peter Lindley. - VII. Crystal class A gates, by An Wang. - VIII. High speed storage: Mechanical design, by Dexter Smith. - IX. Designs for high speed printers, by Elbert Little.
1. Computers, Digital - Design 2. Computers, Digital - Components 3. Computers, Digital - Circuits 4. Data storage systems 5. Recording, Magnetic 6. Lines, Delay - Design 7. Circuits, Gate 8. Printers - High speed - Design.

Progress report no. 8, covering period Feb 10, 1950-May 10, 1950, by Richard Hofheimer and Holly Wilkins. May 1950. 158p photos, drawings, diagrs, graphs, table Microfilm $6.00, Photostat $20.00. PB 112964

Contents: I. Logical design of vacuum tube circuits for computing machinery (continued) part 11: Multipliers. - II. Large scale digital calculator projects, by Elbert Little. - III. Electronic synchronization of motors, by Leonard Butsch. - IV. Class A gates using germanium diodes, by Richard Hofheimer. - V. Magnetic clutches for tape drives, by Robert Wilkins. - VI. Vacuum-operated tape drive, by Robert Wilkins. - VII. Testing magnetic clutches, by Milton McDowell. - VIII. Static magnetic delay lines, by An Wang. - IX. Tape-record circuit using the new Raytheon thin pole piece, by Guy Boucher. - X. Printing systems, by Marshall Kincaid. - XI. Application of the magnetic power pulse gate, by Howard Cohen. - XII. Electrochemical computer elements, by Gerrit Blaauw.
1. Computers, Digital - Design 2. Computers, Digital - Components 3. Computers, Digital - Circuits 4. Clutches, Magnetic 5. Drives, Magnetic 6. Lines, Delay - Magnetic 7. Recorders, Tape 8. Circuits, Gate.

An isotope handling calculator, an A.E.R.E. report, by R. West. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Apr 1953. 5p photo Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.40. PB 113022

HD. 899. S. O. code no. 70-674-1-53.
1. Isotopes - Calculators - Gt. Brit. 2. AERE I/R 1063.

Kearfott temperature-sensing bulbs, by Andrew I. Dahl. U. S. National Bureau of Standards. Jul 1950. 12p photos, drawings, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 113066

The Kearfott temperature sensing bulb is a platinum resistance thermometer encased in an inconel tube. Calibration data from 32° F to 1400° F for the two instruments tested are presented. Calibration data on one of the instruments for the effect of radiation and stem conducting, and the response rate in a moving gas stream are presented. The velocity-temperature effect of the moving gas stream is discussed. Contract no. W33-038-ac-19805. NBC Project 3622. AAF TR 6068.

Low-power wide-tuning range U-H-F triode oscillators, by F. J. Kamphoefner. Stanford University. Electronics Research Laboratory, Stanford, Calif. Jun 1949. 111p photos, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.75, Photostat $15.00. PB 113021

The investigation considers low-power negative-grid triode oscillators for the frequency range of 300 to 1,000 Mc. Discussion is mainly confined to oscillators using a single tuned circuit between grid and plate in the modified Colpitts circuit wherein the feedback is provided by the internal tube capacitances. Among the factors considered are the optimum feedback conditions, lead inductance, transit time, and high-frequency losses. Contract N6-onr-251, consolidated task no. 7(NR-078-360). SU ERL TR 16.

Machine solution of problems for the Office of Air Research. Harvard University. Computation Laboratory. Under Contract AF33(038)-9461. Order separate parts described below from Library of Congress, Publication Board Project, Washington 25, D. C., giving PB number of each part ordered.

Progress report no. 9, covering period 1 Jan 1950-1 Jun 1950, by Elbert Little and Betty Jennings. Jun 1950. 147p diagrs, tables Microfilm $5.75, Photostat $18.75. PB 112963

Contents: I. Computation services: Status report no. 1. Status of computation of the Mathieu functions, by Orten Gadd. - Status report no. 2. Status of the Bessel functions, by John A. Harr. - II. Problem report no. 15. Tilt determination of aerial photographs (AF problem no. 28), by Warren L. Semon. - Problem no. 16 (preliminary). Flow patterns with a free stream Mach number close to one (AF problem no. 26), by Peter F. Strong. - Problem report no. 17. Turbojet-rocket combination, by Theodore Singer. - Problem report no. 18. Computations of complex refractive index from generalized magneto-ionic theory, by John A. Harr.
1. Mark I (Computer) 2. Mathematical equations and solutions 3. Mathieu functions (Aerodynamics) 4. Bessel functions 5. Photography, Aerial - Tilt - Calculation 6. Jet engines, Turbojet - Thrust 7. Refraction indexes.

Progress report no. 15, covering period 1 Dec 1950-Mar 1, 1951, by Holly Wilkins and Robert Burns. Mar 1951. 97p tables Microfilm $4.25, Photostat $12.50. PB 112967

Contents: I. Computation services. - II. Reports on methods and solutions of Air Force problems on Mark I calculator. Problem report no. 23. Determination of the modulation envelope (AF problem 34), by Theodore Singer. - Problem report no. 24. Tables of coefficients for complex Lagrangian interpolation in a square at an internal of 1/100 of the side (AF problem 52), by Robert Ashenhurst (Introduction to the tables prepared by Dr. Walther and Dr. H. Unger).
1. Mathematical equations and solutions
2. Tables, Mathematical 3. Radio frequencies - Modulation 4. Lagrange equations.

Progress report no. 20, covering period 1 Mar 1951-1 Nov 1951, by Holly Wilkins and Robert Burns. Nov 1951. 97p diagrs, graphs, tables Microfilm $4.25, Photostat $12.50. PB 112969

Contents: I. Computation services. - II. Reports on methods and solutions of Air Force problem on Mark I calculator. Problem report no. 25. Coordinate determination of ground points on aerial photographs (AF problem no. 48), by Edward Seligman. - Problem report no. 26. Determination of the modulation envelope, II (AF problem no. 34), by Theodore Singer. - Problem report no. 27. Computation of the intensities of vibrational spectra of electronic bands in diatomic molecules (AF problem no. 56), by Frank Gucker. - Problem report no. 28. Solution of a reciprocal equation of the eighteenth degree with real coefficients (AF problem no. 36), by Robert Ashenhurst and Peter Strong. - Problem report no. 29. Reduction of data obtained from the tracking of an airplane (AF problem no. 61), by Robert Ashenhurst. - Problem report no. 30. Note on Vol. XXIII, Annals of the Computation Laboratory, tabulation of the error function (AF problem no. 41), by Warren Semon. - Problem report no. 31. Note on some computations for the design of Mark IV (AF problem no. 64), by Orten Gadd and Peter Strong. Report no. 27 includes theory of C. Manneback.
1. Mathematical equations and solutions
2. Computers, Digital - Design 3. Mark IV (Computer) 4. Photography, Aerial 5. Radio frequencies - Modulation 6. Approximate computations 7. Polynomials - Roots.

Numerical solution of Laplace's equation on ORDVAC, by David Young and Francis Lerch. U. S. Aberdeen Proving Ground. Ballistic Research Laboratories, Aberdeen, Md. Jul 1953. 22p diagrs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 112913

By the use of an improved iterative method only 72 iterations were required to solve on the ORDVAC a boundary value problem involving Laplace's equation as compared with 676 iterations which were required with the usual Gauss-Seidel method. Other theoretical estimates on the improved method were tested on ORDVAC and found to hold reasonably well. The solutions of difference equations with different mesh sizes were compared with the exact solution of the differential equation and the error found to vary approximately as the square of the mesh size. Project no. TB 3-0007K of the Research and Development Division, Ordnance Corps. APG BRL MR 708.

On the use of Richardson's method for the numerical solution of Laplace's equation on the ORDVAC,

by David Young and Charles H. Warlick. U. S. Aberdeen Proving Ground. Ballistic Research Laboratories, Aberdeen, Md. Jul 1953. 30p diagrs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 112912

The use of the iterative method of Richardson for solving the difference equation analogue of Laplace's equation on the ORDVAC is described. The actual gain in rate of convergence over the usual method is found to agree reasonably well with the theoretical gain. A flow chart and coding for ORDVAC are given together with detailed discussion of methods used to control the accumulation of rounding errors. Project no. TB 3-0007K of the Research and Development Division, Ordnance Corps. APG BRL MR 707.

Random number generation on the BRL high-speed computing machines, by M. L. Juncosa. U. S. Aberdeen Proving Ground. Ballistic Research Laboratories, Aberdeen, Md. May 1953. 24p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 112905

Procedures requiring very few orders and storage for generation of pseudo-random numbers on the ORDVAC, EDVAC, and ENIAC are described. The results of some statistical tests performed on some numbers produced by the method on ORDVAC are given. A mathematical appendix contains the number-theoretic background and theorems used in the description of the method. Project no. TB 3-0007K of the Research and Development Division, Ordnance Corps. APG BRL R 855.

Some problems solvable on computing machines, by Mark Lotkin. U. S. Aberdeen Proving Ground. Ballistic Research Laboratories, Aberdeen, Md. Jul 1953. 14p diagrs, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 112904

Project no. TB 3-0007K of the Research and Development Division, Ordnance Corps.
1. Computers - Uses 2. Mathematical equations and solutions 3. APG BRL MR 693.

Systematic survey of coders and decoders, by Bernard Lippel. U. S. Signal Corps Engineering Laboratories, Fort Monmouth, N. J. Mar 1953. 27p drawings, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 113012

A paper prepared for delivery before the Institute of Radio Engineers, surveys the field of coders and decoders in an original manner which permits a certain amount of generalization regarding the behavior and capabilities of various devices. Signal Corps Proj. No. 505-C. Dept. of the Army Proj. No. 3-21-01-053. SCEL TM M-1494.

Tungsten oxide shadowing of electron micrographs, by P. G. Wilkinson and L. S. Birks. U. S. Naval Research Laboratory. Apr 1949. 8p photos Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 112974

Tungsten oxide is shown to be a feasible shadowing material for electron micrographs, and a comparison is made with gold shadowing. Tungsten oxide has the advantage of giving a smoother background, which should permit one to distinguish smaller particles. NRL P-3443.

MACHINERY

Bemerkungen zum verschleissproblem (Remarks on the problem of wear), by W. Späth. Translated by Werner A. Pohle, edited by F. A. Raven. May 1952. 17p graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 112938t

From Schweizer archiv, July 1951, p. 214-219.
1. Wear - Germany 2. Fatigue - Tests - Germany 3. NAVSHIPS T475 4. STS 139.

Berechnungen und modellversuche an wasser-und luftlagern. (Calculations and model tests on water and air bearings), by Friedrich Gottwald and Richard Vieweg. Translated and edited by F. A. Raven. Oct 1953. 21p drawing, graphs, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 112986t

Translated from Zeitschrift für angewandte physik, vol. II, no. 11, 1950, p. 437-443.
1. Bearings, Antifriction - Lubrication - Theory - Germany 2. Bearings, Antifriction - Tests - Germany 3. Lubricants - Air - Germany 4. NAVSHIPS T545 5. STS 178.

Kavitatsiia nervonostei poverkhosti i vyzyvaemaia eiu eroziia (Cavitation due to surface roughness and erosion induced by it), by K. K. Shalnev. Translated by Rose Jermain, edited by Margaret W. Raven. May 1952. 11p diagrs, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 112937t

From Proceedings of the Academy of Science, Moscow, vol. 78, no. 1, 1951, p. 33-36. Summary of STS 115 (PB 106238) and STS 121 (PB 106239).
1. Cavitation - Russia 2. Roughness, Surface - Russia 3. Turbines, Hydraulic - Corrosion - Russia 4. NAVSHIPS T474 5. STS 133.

Limiting line and its relation to the critical Mach number, by Hideo Yoshihara. U. S. Air Materiel

Command, Wright-Patterson Air Force Base, Dayton, Ohio. Nov 1947. 19p diagrs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 113065

Several examples of limiting lines occurring in a two-dimensional isentropic irrotational flow of a compressible fluid are analyzed in detail, using the Prandtl-Busemann Characteristic Method. The role of the limiting line in determining the critical Mach number is discussed. Project no. HA-219. AAF TR 1149.

Rollenlager als lauflager für schiffswellen (Roller gearings as shaft bearings for marine propeller shafts), by F. Helbig and P. Eschmann. Translated and edited by F. A. Raven. Oct 1953. 24p photos, drawings, tables (1 fold) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 112982t

Translated from Konstruktion vol. 3, no. 10, 1951, p. 302-308.
1. Bearings, Roller - Germany 2. Shafts, Propeller - Bearings - Germany 3. NAVSHIPS T537 4. STS 180.

Salt water valve stems and trim. Fifth report on alternate materials: Review of material specifications for Bureau of Ships by the Advisory Committee on Sea-Water Valves, A.S.M. of the Minerals and Metals Advisory Board. National Research Council. Division of Engineering and Industrial Research. Minerals and Metals Advisory Board. Dec 1953. 16p table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 113118

Contract DA-49-025-sc-83.
1. Valves - Materials 2. Valves - Specifications 3. Valves - Coatings, Corrosion resistent 4. Monel metal - Substitutes 5. MMAB-60-M 6. SIG Contract DA-49-025-sc-83.

Shell molding process. Progress report no. 1 on application to the manufacture of steam turbine blades, by L. S. Denning. U. S. Naval Shipyard, New York. Material Laboratory. Apr 1952. 6p photos Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 113103

For progress report no. 2 see PB 111004.
1. Turbines - Blades - Molding 2. Molds, Casting - Shell 3. Castings, Precision 4. Metals - Casting.

Utilization of plastic-bonded sands for molds and cores. U. S. Naval Shipyard, New York. Material Laboratory. Feb 1950. 28p photos, drawings Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 113102

Laboratory project report 5118. Progress report 1, NS 014-079. Details of process are described in FIAT FR 1168 (PB 81284).
1. Sands, Molding 2. Molds, Casting - Materials 3. Casting, Precision.

Zur berechnung der reibungswärme und der kühlölmenge bei schnellaufenden gleitlagern (On the calculation of frictional heat and cooling oil quantity for high-speed friction bearings), by E. Heidelbrook and Dr. Hagedorn. Translated by Werner A. Pohle, edited by F. A. Raven. May 1952. 10p graphs, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 112936t

Translated from Der Technik, vol. 6, no. 1, Jan 1951, p. 21-23.
1. Bearings, Friction - Lubrication - Germany 2. Friction - Theory - Germany 3. NAVSHIPS T473 4. STS 134.

MEDICAL RESEARCH AND PRACTICE

Dynamics of blood flow under abnormal pressure: Circulatory and respiratory responses to acute hypoxia in animals "acclimated" to altitude, by Earl F. Beard, Alfred L. L. Bell, Jr., and Thomas W. Howell. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Aug 1953. 12p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 112891

Certain differences from respiratory and circulatory reactions previously described in normal unacclimated dogs during acute hypoxia are discussed. AAF SAM Proj no. 21-1204-0001, Report no. 1.

Efficiency of impaired ears in noise: A. Thresholds for pure tones and for speech, by Charles Lightfoot, Raymond Carhart, and John H. Gaeth. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Sep 1953. 20p diagr, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 112894

The auditory efficiency, in noise, of impaired and of normal ears is compared. Results are analyzed not only in terms of comparison between the two groups but also against the background of knowledge, which is available in the literature, regarding masking in the normal ear. Contract no. AF 33(038)-22645. 13th report under the project "Biological aspects of noise and vibration." AAF SAM Proj no. 21-1203-0001, Report no. 4.

Evaluation and reduction of radio interference characteristics of electromedical equipments.

Electro-Search, Philadelphia, Pa. Under Contract NOBsr-63199. Order separate parts described below from Library of Congress, Publication Board Project, Washington 25, D. C., giving PB number of each part ordered.

Quarterly interim engineering report no. 1, for period 26 Jan 1953 to 30 Apr 1953, by Irving Brown. May 1953. 9p diagr Microfilm $1.25, Photostat $1.25. PB 112895

1. Radio interference - Elimination 2. Electromedical apparatus - Interference - Reduction.

Quarterly interim engineering report no. 2, for period 1 May 1953 to 31 July 1953, by Irving Brown. Aug 1953. 6p Microfilm $1.25, Photostat $1.25. PB 112900

1. Radio interference - Elimination 2. Electromedical apparatus - Interference - Reduction.

Factors in night vision sensitivity. III: The interrelation of size, brightness and location, by Sybil G. De Groot, Jane M. Dodge and Jo Ann Smith. U. S. Navy. Medical Research Laboratory, Naval Submarine Base, New London, Conn. Sep 1953. 17p photos, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 113105

Bureau of Medicine and Surgery, Navy Department, Project NM 003041.09.05. Medical Research Laboratory Report no. 234, Volume XII, no. 19. Bibliography included.
1. Night vision - Acuity - Effect of light flashes 2. Night vision - Tests 3. Vision - Dark adaptation - Effect of bright illumination 4. Vision - Dark adaptation - Effect of location of illumination 5. Vision - Dark adaptation - Effect of size of illumination 6. NAV MRL 234 7. NMRI Proj NM 003 041.09.05.

Jungle survival and rescue of air evacuation aircraft personnel, by Frederick A. Rodewald. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Sep 1953. 12p table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 112893

The following conclusions were reached: Survivors of air evacuation aircraft crash must remain in vicinity of wrecked aircraft until rescued. Equipment for aircraft traveling over jungle areas should be augmented to contain food for extended period, adequate hunting equipment, heating and lighting facilities, sufficient quantities of insect repellent, and more effective signaling devices. AAF SAM Proj no. 21-40-004, Report no. 2.

Palmar sweat as an index of anxiety: A field method suitable for large groups, by Robert A. McCleary. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Oct 1953. 12p photos, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 113009

The technique requires the subject to hold a bag of crystals whose color shifts as their degree of hydration increases. Comparing the color of the experimental crystals to a set of standards allows a palmar sweat score to be obtained. AAF SAM Proj no. 21-1207-0004, Report no. 1.

Relation of the tricarboxylic acid cycle to bacterial infection: Survival time in mice infected with pathogens and then given Krebs cycle inhibitors or intermediates, by L. Joe Berry, Penelope Merritt, and Roland B. Mitchell. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Oct 1953. 10p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 113085

Comparison is made of the survival time of mice infected with Streptococcus pyogenes, Diplococcus pneumoniae, Proteus morganii, Micrococcus pyogenes var. aureus, Corynebacterium kutscheri, and Klebsiella pneumoniae and injected at intervals with sublethal quantities of malonate, arsenite, fluoroacetate, citrate, and succinate. AAF SAM Proj no. 21-1041-0004, Report no. 2.

Studies on the electrophysiology and the metabolism of the retina, by Werner K. Noell. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Oct 1953. 131p photos, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $5.50, Photostat $17.50. PB 113090

Electrical and histological phenomena of the mammalian retina are studied and the effects of various poisons tested in order to determine relations between the metabolism of the retina and its function. The study is based upon the effects of intravenously administered agents (iodoacetate, sodium iodate, and azide) in rabbit, cat, and monkey. AAF SAM Proj. no. 21-1201-0004, Report no. 1.

Study of night myopia, by Brian O'Brien. Rochester University. Institute of Optics. May 1953. 27p diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 113006

The literature on night myopia is reviewed in some detail, and a critical evaluation of certain outstanding papers is undertaken. There is general agreement upon the effect of chromatic aberration and the Purkinje shift, but disagreement on the importance of spherical aberration and involuntary accommodation in producing the myopia. Contract W33(038)F18317. AAF WADC TR 53-206.

Torsion-ballistocardiography, with special reference to patterns in surgically amenable cardio-

vascular diseases, by Kurt R. Reissmann, E. Grey Dimond, and Fritz Haber. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Oct 1953. 35p photo, drawings, diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 112892

The recoil forces generated in the circulatory system were converted into a momentum of force (torque) by using a table supported by a single steel bar in its center. With such a torsion-ballistocardiograph, information can be obtained on the site of origin of the forces and on their direction, because the amplitude of the table is proportional to the product force times lever arm (i.e., distance from the center of rotation), and the latter can be varied by placing the subject in various positions relative to the center of rotation. Fifth report under the project "Dynamics of blood flow under abnormal pressure." AAF SAM Proj. no. 21-1204-0001, Report no. 3.

METALS AND METAL PRODUCTS

Abstract compilation of the literature on high temperature oxidation of metals, by W. Martin Fassell, Jr., Martha S. Chamberlain, Robert C. Peterson. Utah. University. Dept. of Metallurgy. Under Contract DA-04-495-ORD-237. Order separate parts described below from Library of Congress, Publication Board Project, Washington 25, D. C., giving PB number of each part ordered.

Technical report no. III, part I. n.d. 353p Microfilm $9.00, Photostat $45.00. PB 113029

Technical report no. III, part II. n.d. 319p Microfilm $9.00, Photostat $40.00. PB 113030

Analysis of plastic behavior of metals with bonded birefringent plastic, by J. D'Agostino, D. C. Drucker, C. K. Liu. Brown University. Graduate Division of Applied Mathematics, Providence, R. I. Oct 1953. 24p photos, diagrs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 112909

Sheets of photoelastic material were bonded to metal parts to provide a means of measuring the plastic strains in the surface of the metal. Two types of procedure were explored. In one the entire assembly of metal and plastic was heated to obtain low modulus and linear response from the plastic as in the freezing method of photoelasticity. In the other, the plastic chosen was of the flexible type so that it could follow the large strains at room temperature. Techniques of bonding with adhesives and casting the plastic directly on the metal were explored. Photoelastic properties of a number of plastics including the adhesives were also investigated at room and at elevated temperature. Contract DA-19-020-ORD-798. GDAM DA-798/6. GDAM TR 6.

Cathodic protection of pipelines and storage tanks, by V. A. Pritula. Gt. Brit. Dept. of Scientific and Industrial Research. Oct 1953. 166p drawings, diagrs, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $2.25. PB 112844

S. O. code no. 47-177. Translated from the Russian. Originally published in 1950 in a series of Petroleum and Mined-fuel Literature.
1. Corrosion - Prevention - Russia 2. Pile lines - Corrosion - Prevention - Russia 3. Tanks, Storage - Corrosion - Prevention - Russia.

Development of the physical and chemical properties of the sodium-potassium alloy, by C. T. Ewing, J. A. Grand, R. E. Seebold, and H. B. Atkinson, Jr. U. S. Naval Research Laboratory. Quarterly progress report no. 8. Aug 1948. 12p diagrs, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 113040

Status of active property measurements and all measured results obtained since the preceeding Quarterly Report are presented; apparatuses for measurement of specific heat, thermal conductivity, and surface tension are described briefly. NRL C-3330.

Drahtseilforschung (Wire rope research). Translated and edited by F. A. Raven. Verein Deutscher Ingenieure, Berlin. Nov 1953. 19p graphs (part fold), tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 112985t

Presented at meeting of the Committee for Wire Rope Research, Niederfinow, May 11, 1931. Translated from Zeithschrift des Vereins Deutscher Ingenieure, vol. 75, no. 49, Dec 5, 1931, p. 1485-1488.
1. Cables, Steel - Tests - Germany 2. Cables, Steel - Lubrication - Germany 3. Cables, Wire - Germany 4. NAVSHIPS T542 5. STS 177.

Frictional properties of titanium and its alloys. Annual progress report, Nov 1, 1952 to Dec 31, 1953, by E. Rabinowicz. Massachusetts Institute of Technology. Dept. of Mechanical Engineering. Lubrication Laboratory. Jan 1954. 37p diagr, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 113071

Contract NOas 53-213-C (continuation of Contract NOas 51-1185C).
1. Titanium - Friction 2. Titanium alloys - Friction.

Fundamental investigation of fretting corrosion, by H. H. Uhlig, I. Ming Feng, W. D. Tierney, and A. McClellan. U. S. National Advisory Committee

for Aeronautics. Dec 1953. 52p diagrs, graphs, tables Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 112865

The presentation of the information is made in three parts. Part I describes a test machine for measuring fretting damage under controlled experimental conditions. Part II presents data for mild steel fretted against itself. Consideration is given to the effects of humidity, temperature, test duration, atmosphere, relative slip, pressure, and frequency. Part III suggests a mechanism for the fretting process. NACA TN 3029.

High-strength cast steel for Navy anchors, by R. H. Raring. U. S. Naval Research Laboratory. Apr 1949. 18p photos, graph, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 112920

Report on investigation of cast steel specimens and heat treatment which will have yield strength of 80,000 psi, without the use of potentially scarce materials or liquid quenching. NRL M 3453.

Influence of surface treatment on the fatigue properties of titanium and titanium alloys, by L. Thomassen, M. J. Sinnott, A. W. Demmler, Jr. Michigan. University. Engineering Research Institute, Ann Arbor, Mich. Feb 1953. 11p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 112962

Four different surface and subsurface treatments have been given Ti-75A, and their effect on the fatigue properties as determined by the R. R. Moore rotating-beam machine has been evaluated. Project 2034. Progress report no. 4 under Contract no. AF 33(616)-26.

Measurement of the physical and chemical properties of the sodium-potassium alloy. U. S. Naval Research Laboratory. Order separate parts described below from Library of Congress, Publication Board Project, Washington 25, D. C., giving PB number of each part ordered.

Quarterly progress report no. 2, by C. T. Ewing and R. S. Hartman. Jan 1947. 27p drawings, graphs, tables Microfilm $2.00, Photostat $3.75. PB 113079

The status of active property measurements and all measured results obtained are presented. Included are recent results on viscosity, specific heat, phase separation, and other pertinent data. Where results are given on the property, a description of the current apparatus and methods is presented. NRL problem P-149. NRL P-3057.

Quarterly progress report no. 7, by Curtis T. Ewing, Harold B. Atkinson, Jr., Thomas K. Rice. May 1948. 102p graphs, tables Microfilm $4.50, Photostat $13.75. PB 113080

The status of active property measurements and all measured results obtained are presented. Included are final results for viscosity and density, together with preliminary reporting of surface tension and reaction studies with water. NRL C-3287.

Quarterly progress report no. 9, by Joseph A. Grand, Robert E. Seebold, and Curtis T. Ewing. Oct 1948. 9p Microfilm $1.25, Photostat $1.25. PB 112970

Studies of a long term nature including specific heat, thermal conductivity, surface tension, and contaminants are continuing. The modified specific heat apparatus was used to measure the specific heat of 46 weight percent potassium up to 450° C. Measurements of magnetic susceptibility are included. NRL C-3383.

Resistance of cast aluminum alloys to mechanical shock. First partial report, by Bernard Goldberg. U. S. Naval Research Laboratory. Nov 1948. 21p photos, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 113036

Investigation is made of the mechanical shock resistance of materials in relation to resistance to fracture for a small number of cycles of strain. Six different sand cast aluminum alloys, cast iron and mild steel were tested. Comparison of relative shock resistance was obtained and general methods for obtaining the shock resistance of materials were developed. NRL F-3381.

Results of shear fatigue tests of joints with 3/16-inch diameter 24S-T31 rivets in 0.064 inch-thick Alclad sheet, by Marshall Holt. Addendum no. 1. U. S. National Advisory Committee for Aeronautics. Sep 1953. 9p graphs, tables Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 100197s

1. Aluminum Company of America. Aluminum Research Laboratories, New Kensington, Pa. 2. NACA TN 2012.

METEOROLOGY AND CLIMATOLOGY

Analogue techniques in the forecasting of rainfall, by G. P. Wadsworth. Massachusetts Institute of Technology. Div. of Industrial Cooperation. Nov 1948. 12p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 113120

Report no. III under Contract no. W28-099-ac-398. 1. Rain and rainfall - Forecasting 2. Autocorrelation - Theory.

Atmospheric oscillations at Oklahoma City during the 1953 tornado season, by William L. Donn, Richard Rommer and Frank Press. Columbia University. Lamont Geological Laboratory, Palisades, N. Y. Nov 1953. 20p maps, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 113007

Contract AF 19(122)-441.
1. Oscillations, Atmospheric 2. Microbarovariograms 3. Tornadoes - Detection 4. CUN LGO TRM 2.

Atmospheric purity at Sacramento Peak, White Mountain, and Climax (period from Sep 1948 through Dec 1949), by Walter Orr Roberts and Dorothy Trotter. Harvard University. High Altitude Observatory, Boulder, Colo. Jan 1950. 15p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 113125

Contract W19-122-ac-17, Special report.
1. Atmosphere - Purification.

Atomic nitrogen as a constituent for region F1, by A. P. Mitra. Pennsylvania State College. Ionosphere Research Laboratory, State College, Pa. Nov 1953. 32p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 112888

Both static and dynamic atmospheres have been considered for this purpose. It is shown that, under dynamic conditions, the maximum of ionization produced as a result of photoionization of atomic nitrogen lies between 150 to 200 km, for overhead sun, the best value being somewhere around 170 km. Possible contribution from the ionization of atomic oxygen at the third ionization potential has also been discussed. Contract no. AF 19(122)-44. PSC IRL SR 53.

Computations of the balance of angular momentum and the poleward transport of heat, by Edward N. Lorenz. Massachusetts Institute of Technology. Dept. of Meteorology. Feb 1951. 38p diagrs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 113052

Report no. 6, General circulation project, Contract no. AF 19-122-153.
1. Atmosphere - Angular momentum 2. Atmosphere - Heat transference 3. Enthalpy - Measurement 4. General circulation project, Report no. 6.

Contributions to the theory of the constitution of clouds. Mount Washington Observatory, Inc., Gorham, N. H. Under Contract no. AF 28(099)-25. Order separate parts described below from Library of Congress, Publication Board Project, Washington 25, D. C., giving PB number of each part ordered.

First quarterly progress report, by Wallace E. Howell, Raymond Wexler, and Seymour Braun. Jan 1949. 65p graphs, tables Microfilm $3.00, Photostat $8.75. PB 113057

1. Clouds - Formation - Theory 2. Clouds - Physical properties 3. Drops, Liquid - Size - Measurement.

Second quarterly progress report, by Wallace E. Howell, Raymond E. Wexler, and Seymour Braun. Apr 1949. 58p graphs, tables Microfilm $2.75, Photostat $7.50. PB 113058

1. Clouds - Formation - Theory 2. Clouds - Physical properties 3. Drops, Liquid - Size - Measurement.

Third quarterly progress report, by the Staff of the Mount Washington Observatory. Jul 1949. 93p diagrs, maps, graphs, tables Microfilm $4.25, Photostat $12.50. PB 113068

Contents: A. Drop distribution in clouds, by Wallace E. Howell, Raymond Wexler and Seymour Braun. - B. Study of the meteorological conditions conducive to icing on Mount Washington, by Roland J. Boucher. - Appendix. Detailed study of two icing situations representing two different types of storm. - Cloud data observations.
1. Clouds - Formation - Theory 2. Ice formation - Meteorological analysis 3. Precipitation - Theory.

Fifth quarterly progress report, Jan 31, 1950. Jan 1950. 64p tables Microfilm $3.00, Photostat $8.75. PB 113061

Contents: I. Personnel and administration. - II. Drop size distribution in clouds, by Wallace E. Howell and Seymour Braun. - III. Study of the meteorological factors conducive to icing on Mount Washington, by Roland J. Boucher. - IV. Cloud data observations.
1. Clouds - Formation - Theory 2. Drops, Liquid - Size - Measurement 3. Ice formation - Meteorological aspects.

Sixth quarterly progress report, Apr 30, 1950. Apr 1950. 60p tables Microfilm $2.75, Photostat $7.50. PB 113063

Contents: Analytic expression for supersaturation, by Seymour Braun. - II. Study of the meteorological factors conducive to icing on Mount Washington, by Roland J. Boucher.
1. Clouds - Formation - Theory 2. Ice formation - Meteorological aspects.

Final report, part one, year ending Oct 20, 1949. Oct 1949. 43p maps, graphs, tables Microfilm $2.50, Photostat $6.25. PB 113059

Contents: I. General summary. - II. Theory for the drop size distribution in clouds, by Wallace E. Howell, Raymond Wexler and Seymour Braun. - III. Study of the meteorological conditions conducive to icing on Mount

Washington, by Roland J. Boucher.
1. Clouds - Formation - Theory 2. Drops, Liquid - Size - Distribution - Theory 3. Ice formation - Meteorological analysis.

Final report, part two, year ending Oct 20, 1949. Oct 1949. 204p tables Microfilm $7.50, Photostat $26.25. PB 113060

1. Clouds - Formation 2. Drops, Liquid - Size - Measurement 3. Ice formation - Meteorological analysis.

Distribution of the mean monthly wind stress over the Gulf of Mexico, by Guy A. Franceschini. Texas. Agricultural and Mechanical College. Dept. of Oceanography, College Station, Texas. Aug 1953. 22p maps, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 112884

Scientific report no. 1. Contract no. AF 19(604)-169.
1. Ocean temperature - Measurement - Gulf of Mexico 2. Winds - Velocities - Measurement - Gulf of Mexico.

Dynamics of the semi-permanent pressure cells, by G. P. Wadsworth. Massachusetts Institute of Technology. Div. of Industrial Cooperation. Feb 1949. 62p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.00, Photostat $8.75. PB 113121

Report no. IV under Contract no. W28-099-ac-398.
1. Rain and rainfall - Forecasting 2. Autocorrelation - Theory.

Effect of winds and bodily tides on the annual variation in the length of day, by Yale Mintz and Walter Munk. California. University. Dept. of Meteorology, Los Angeles, Calif. Oct 1953. 24p diagr, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 112999

Contract AF 19(122)-48. Scientific report no. 5.
1. Earth - Rotation - Effect of tides 2. Earth - Rotation - Effect of winds 3. Tides - Effect on earth rotation 4. Winds - Effect on earth rotation.

Hemispherical study of the atmospheric angular momentum balance, by Victor P. Starr. Massachusetts Institute of Technology. Dept. of Meteorology. May 1951. 15p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 113053

Report no. 7, General circulation project, Contract no. AF 19-122-153.
1. Atmosphere - Angular momentum 2. Atmosphere - Energy 3. Atmosphere - Circulation 4. General circulation project, Report no. 7.

Investigation of monthly and seasonal weather anomalies of the southern hemisphere with special reference to South America, by Morton J. Rubin. Weather Services, Inc., Boston, Mass. 1953. 38p maps, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 113023

Scientific report no. 2 under Contract no. AF 19(604)-449.
1. Meteorology - South America.

Investigation of the general circulation of the atmosphere. California. University. Dept. of Meteorology, Los Angeles, Calif. Under Contract AF 19(122)-48. Order separate parts described below from Library of Congress, Publication Board Project, Washington 25, D. C., giving PB number of each part ordered.

Report no. 7, pt. II: Observed mean field of motion of the atmosphere, by Yale Mintz and Gordon Dean. Mar 1951. 55p maps, diagrs, graphs Microfilm $3.00, Photostat $7.75. PB 113237

1. Atmosphere - Circulation 2. Winds - Velocity - Measurement 3. Wings, Geostrophic - Measurement.

Report no. 7, part III: Summer situation on 300, 200, and 100 mb maps over the northern hemisphere, by Adam Kochanski. Mar 1951. 17p maps, tables Microfilm $2.00, Photostat $2.75. PB 113238

1. Atmosphere - Circulation 2. Winds - Velocity - Measurement.

Report no. 7, part IV: Progress report, by Jacob Bjerkness. Mar 1951. 4p. Microfilm $1.50, Photostat $1.50. PB 113239

1. Atmosphere - Circulation.

Report no. 8, part I: Geostrophic poleward flux of sensible heat in the month of January 1949, by Yale Mintz. Jun 1951. 16p graphs, table Microfilm $2.00, Photostat $2.75. PB 113248

1. Atmosphere - Circulation 2. Atmosphere - Temperature - Measurement.

Investigation of the ionosphere utilizing sounding rockets (rocket reception of radio pulses over long distances), by Ward C. Low and Raymond M. Knight. Final report under Contract AF 19(122)-36. Boston University. Upper Atmosphere Research Laboratory, Boston, Mass. Jun 1953. 133p photos, drawings, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $5.50, Photostat $17.50. PB 112886

1. Ionosphere - Research 2. Rovkets, Upper air - Equipment.

Meridional eddy flux of energy in the northern hemisphere, by Robert M. White. Massachusetts Institute of Technology. Dept. of Meteorology. May 1950. 43p diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 113051

Report no. 3, General circulation project, Contract no. AF 19-122-153.
1. Atmosphere - Energy 2. Enthalpy - Theory
3. General circulation project, Report no. 3.

Note on the seasonal variation of the meridional flux of angular momentum, by Victor P. Starr. Massachusetts Institute of Technology. Dept. of Meteorology. Aug 1951. 16p graph, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 113054

Report no. 8, General circulation project, Contract no. AF 19-122-153.
1. Atmosphere - Angular momentum 2. General circulation project, Report no. 8.

Physical characterization of the general circulation, by Victor P. Starr. Massachusetts Institute of Technology. Dept. of Meteorology. Nov 1949. 46p diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 113049

Report no. 1 on General circulation project, Contract no. AF 19-122-153. Appendix: Essay on the general circulation of the earth's atmosphere, by Victor P. Starr (Reprinted from Journal of meteorology, vol. 5, no. 2, Apr 1948, p. 39-43). - On the production of kinetic energy in the atmosphere, by Victor P. Starr (Reprinted from Journal of Meteorology, vol. 5, no. 5, Oct 1948, p. 193-196). - Transport of kinetic energy in the atmosphere, by Victor P. Starr (Reprinted from Journal of Meteorology, vol. 6, no. 2, Apr 1949, p. 160). - Dynamic characteristics of a tilted-through model, by Lester Machta. - Study of the flow of angular momentum in the atmosphere, by William K. Widger, Jr. - Role of mountains in the angular-momentum balance of the atmosphere, by Robert M. White. - Significant correlation between meridional heat transport and the zonal character of the general circulation, by H. C. Willett.
1. Atmosphere - Circulation 2. Atmosphere - Angular momentum 3. Atmosphere - Energy 4. Vortex motion - Theory 5. General circulation project, Report no. 1.

Possible experimental design for testing the effect of artificial cloud seeding, by G. P. Wadsworth. Massachusetts Institute of Technology. Div. of Industrial Cooperation. Apr 1951. 33p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 113128

Contract AF 19-122-401.
1. Clouds - Seeding - Effectiveness 2. Precipitation - Theory.

Preliminary results of flare observations from 15 Feb 1950 to 15 Nov 1950, by John W. Evans, Ch'ing-Sung Yü, Bruno Witte. Harvard University. Harvard College Observatory. Jan 1951. 44p diagrs (1 fold), graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 113056

This report describes the observing apparatus, presents the observational material derived from it, and discusses briefly some of the implications of the observations. Published under AMC Contract W19-122ac-17 for the establishment of a solar observatory at Sacramento Peak, New Mexico.

Preliminary studies of the eddy momentum flux evaluated from observed wind soundings, by V. P. Starr, R. M. White, E. N. Lorenz. Massachusetts Institute of Technology. Dept. of Meteorology. Nov 1950. 18p map, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 113062

Report no. 5, General circulation project, Contract no. AF 19-122-153.
1. Atmosphere - Angular momentum 2. Winds - Velocities - Measurement 3. Rawin data 4. General circulation project, Report no. 5.

Quarterly summary of observations made at Seabrook, New Jersey, Apr 1, 1953 to June 30, 1953. Johns Hopkins University. Laboratory of Climatology, Seabrook, N. J. 1953. 52p photos, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photostat $7.50. PB 113026

Publications in climatology, vol. VI, no. 4. Scientific report no. 4, Contract AF 19(604)-289. Continues records originally published in Interim report "Micrometeorology of the surface layer of the atmosphere."
1. Micrometeorology 2. Climatology.

Seasonal variation in the absorption of solar radiation by atmospheric ozone at 9.6 microns, by Arthur Adel. Arizona State College, Flagstaff, Ariz. Dec 1953. 16p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 113000

Scientific report no. HA-5 on Contract no. AF 19(122)-198.
1. Solar radiation - Absorption - Measurement
2. Ozone - Spectrographic analysis.

Some aspects of the dispersion of pollens and industrial contaminants in relation to micrometeorology, by E. Wendell Hewson. Michigan. University. Engineering Research Institute, Ann Arbor, Mich. Oct 1953. 46p photo, map, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 113077

This report critically reviews some of the published research on the dispersion of pollens and industrial contaminants. The production of pollens and industrial contaminants, their introduction into, diffusion through, and removal from the atmosphere are discussed. Possible influences of pollen pollution and industrial contaminants on climate and on health are indicated. Contract no. AF 19(604)-792. Project 2160. Scientific report no. 1.

Some exact solutions of the electrodynamical problem of superimposed positive and negative fluids, by J. J. Gibbons and P. E. Bedient. Pennsylvania State College. Ionosphere Research Laboratory, State College, Pa. Oct 1953. 46p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 112887

The problem of the electrodynamics of an ionized medium is approached by seeking some self-consistent solutions for problems with simple symmetries. The differential equations for such a study are given in Lorentz invariant form and several exact solutions to this system are presented. Contract no. AF 19(122)-44. PSC IRL SR 51.

Theory of apparent radiance in the clear atmosphere, by Marvin M. Mueller. U. S. Aberdeen Proving Ground. Ballistic Research Laboratories, Aberdeen, Md. Jun 1953. 63p diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.00, Photostat $8.75. PB 112901

Project no. TB 3-0538D of the Research and Development Division, Ordnance Corps.
1. Sky illumination - Theory 2. Light - Theory
3. Atmosphere - Light transmission - Theory
4. APG BRL R871.

Theory of linear flame propagation, by David Layzer. Harvard University. Harvard College Observatory. Solar Dept. 1953. 35p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 113025

Contract AF 19(604)-146. Contents: Part I. Existence, uniqueness, and stability of the steady state. - Part II. Structure of the steady state.
1. Flame - Propagation - Theory 2. Flame - Stability 3. Solar energy - Research 4. HU HCO SR 13.

Theory of snow crystal habit and growth, by J. S. Marshall and M. P. Langleben. McGill University. MacDonald Physics Laboratory. "Stormy Weather" Research Group. Jul 1953. 60p diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photostat $7.50. PB 113027

Contract no. AF-19(122)-217. Scientific report MW-9.
1. Ice crystals - Growth 2. Psychrometric theory 3. MW 9.

Two-dimensional model seismology, by Jack Oliver, Maurice Ewing, and Frank Press. Columbia University. Lamont Geological Observatory, Palisades, N. Y. Nov 1953. 30p photo, diagr, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 112926

The solutions of many problems in seismology may be obtained by means of ultrasonic pulses propagating in small scale models. Thin sheets, serving as two dimensional models, are particularly advantageous because of their low cost, availability, ease of fabrication into various configurations, lower energy requirements and appropriate dilatational to shear velocity ratios. Four examples are presented: flexural waves in a sheet, Rayleigh waves in a low velocity layer overlying a semi-infinite high velocity layer, Rayleigh waves in a high velocity layer overlying a semi-infinite low velocity layer, and body and surface waves in a disk. Contract AF 19(122)-441. CUN LGO TRS33.

Variations of the northern hemisphere sea-level pressure profile, by Edward N. Lorenz. Massachusetts Institute of Technology. Dept. of Meteorology. Feb 1950. 30p diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 113050

Report no. 2, General circulation project, Contract no. AF 19-122-153.
1. Atmosphere - Pressure 2. General circulation project, Report no. 2.

MINERALS AND MINERAL PRODUCTS

Conservation of industrial diamonds. Report by Panel on Diamond Salvage and Reclamation of the Minerals and Metals Advisory Board. National Research Council. Division of Engineering and Industrial Research. Minerals and Metals Advisory Board. Dec 1953. 50p photos, diagr, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 113116

1. Diamonds, Industrial - Conservation 2. Diamonds, Industrial - Production statistics 3. Bort - Conservation 4. MMAB 55-C.

Durability of reinforced gypsum plaster, by F. A. Blakey. Australia. Commonwealth Scientific and Industrial Research Organization. Div. of Building Research. 1953. 15p photos, graphs, tables Available from Library of Congress, Pub-

lication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 113111

Report T6. 1-1.
1. Plaster, Gypsum - Durability - Australia.

Investigations on building fires. Part VI: Fire resistance of reinforced concrete columns, by F. G. Thomas and C. T. Webster. Gt. Brit. Dept. of Scientific and Industrial Research. Building Research Station, Watford, Eng. 1953. 84p photos, drawings, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.75. PB 112848

S. O. code no. 47-551-18. For Parts I-V see PB 110264, 103185, 103264, 110912.
1. Building materials - Fire resistance - Gt. Brit.
2. Concrete, Reinforced - Fire resistance - Gt. Brit.
3. Concrete aggregates - Fire resistance - Gt. Brit.
4. DSIR NB TP 18.

Production of cobalt from low grade ores; cobalt in the Ergani copper mines. Supplementary report by Panel on Cobalt Supplies of the Minerals and Metals Advisory Board. National Research Council. Division of Engineering and Industrial Research. Minerals and Metals Advisory Board. Dec 1953. 12p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 113117

1. Cobalt - Production 2. Cobalt - Recovery from copper ore 3. Ergani Copper Mines, Ergani, Maden, Turkey 4. MMAB-62-C.

Virginia mineral localities, by Richard V. Dietrich. Virginia. Engineering Experiment Station, Blacksburg, Va. Sep 1953. 56p Available from Engineering Experiment Station, Virginia Polytechnic Institute, Blacksburg, Va. $.50. PB 112879

Bulletin of the Virginia Polytechnic Institute, vol. XLVI, no. 11.
1. Mineral resources - Virginia 2. V EES 88.

ORDNANCE AND ACCESSORIES

Accuracy of M1 rifle scores obtained on the known-distance range, by F. J. McGuigan and Victor H. Denenberg. George Washington University. Human Resources Research Office, Washington, D. C. Jan 1954. 13p graphs, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 113031

1. M1 (Rifle) 2. Marksmanship 3. GWU HRRO RM4.

Bomb penetration project, by C. W. Livingston and F. L. Smith. Colorado School of Mines Research Foundation, Inc., Golden, Colo. Jun 1951. 361p photos (part fold), maps (part fold), fold drawings, graphs (part fold), tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $9.00, Photostat $46.25. PB 112927

Contract DA-29-005 eng-280.
1. Bombing - Effectiveness 2. Projectiles - Penetration 3. Projecticles - Penetration - Theory 4. Bombs - Stress distribution 5. Livingston penetration formula.

Effect of thickness on airfoils with constant vertical acceleration at supersonic speeds, by John C. Martin and Nathan Gerber. U. S. Aberdeen Proving Ground. Ballistic Research Laboratories, Aberdeen, Md. May 1953. 36p diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 112907

Project no. TB 3-0108H of the Research and Development Division, Ordnance Corps.
1. Flow, Supersonic - Theory 2. Airfoils - Thickness - Effect on lift 3. Airfoils - Lift 4. Busemann second-order-approximation theory 5. Mach number - Effect 6. APG BRL R 866.

PERSONNEL APTITUDE TESTING

Implications of learning theory for the design of audio-visual aids, by Tracy S. Kendler, Howard W. Kendler, and John O. Cook. New York University. Psychological Research Center. Nov 1951. 37p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 113144

1. Learning - Theory 2. Training films, Audio-visual 3. Psychology, Applied 4. AAF HRRL MR12a.

Proceedings, held in conjunction with the 118th meeting of the American Association for the Advancement of Science. Conference on Scientific Manpower, Philadelphia, Pa. Dec 1951. 80p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.50, Photostat $10.00. PB 113094

Contents: Session I: Supply and demand. Scientific manpower behind the iron curtain, by David Rodnick. - Support of graduate student training, by Harry C. Kelly. - Scientists and engineers, and evaluation of our national requirements and resources, by John F. Hilliard. - Highlights of supply and demand for social scientists, by Elbridge Sibley. - Summarizers comments, by Philip N. Powers. - Session II: Post-baccalaureate training. In-service training of engineers and scientists in industry, by Guy Kleis. - In-service training of engineers and scientists in government, by William G. Torpey. - Role of the graduate school in the development of human resources, by Herbert E.

Longenecker. - Summarizer's comments, by Marsh W. White. - Session III: Selection techniques-psychological background. Selective service college qualification test, by Henry Chauncey. - Selection of fellows, by Claude L. Shipp. - Measuring research effectiveness, by John C. Flanagan. - Summarizer's comments, by Claude E. Hawley.
1. Scientists - Education 2. Scientists - Selection 3. Engineering - Education.

Report on the television project conducted by the Navy at its Special Devices Center, Port Washington, N. Y., June 30 to Sep 8, 1949, by Samuel F. Harby. U. S. Air Force. Human Resources Research Laboratories, Bolling Air Force Base, Washington, D. C. Sep 1949. 16p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 113131

1. Television - Educational value 2. AAF HRRL MR2.

Some factors influencing the effects of audience participation on learning from a factual film. Preliminary report on a study conducted under Air Force Contract no. 33(038)-22944, prepared by Donald N. Michael. Boston University. School of Public Relations and Communications. Dec 1951. 50p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 113146

1. Training films - Audience 2. AAF HRRL MR13.

Study of the effects of different types of review and of "structuring" sub-titles on the amount learned from a training film, by Joseph Miller and Seymour Levine. U. S. Air Force. Human Resources Research Laboratories, Bolling Air Force Base, Washington, D. C. Mar 1952. 34p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 113152

Contract AF 33(038)-13507.
1. Motion pictures, Educational 2. Training films 3. AAF HRRL MR17.

PHYSICS

General

Biaxial pointing control development. Final report under Contract no. W19-122-ac-9, by W. B. Pietenpol. Colorado. University. Dept. of Physics. Upper Air Laboratory, Boulder, Colo. Nov 1953. 47p photo, drawing, diagr Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 113010

Includes abstracts of special reports issued under this contract.

1. Solar radiation - Measurement - Equipment 2. Solar radiation - Photography 3. Solar radiation - Spectrography 4. Servomechanisms - Design 5. Asimuth instruments 6. Zodiacal light 7. Sun - Ultraviolet spectrum - Measurement - Equipment 8. Atmosphere, Upper - Research.

Circulation and distortion of liquid drops falling through a viscous medium, by P. Savic. National Research Council of Canada. Div. of Mechanical Engineering. Jul 1953. 59p photos, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photostat $7.50. Available for exchange from Division of Mechanical Engineering, National Research Council of Canada, Montreal Road, Ottawa, Canada. PB 112975

1. Drops, Liquid - Distortion - Canada 2. Drops, Liquid - Circulation - Canada 3. Flow, Viscous - Theory - Canada 4. Equations of motion - Canada 5. NRCC ME MT-22.

Distribution of velocities in molecular beams of potassium, by A. I. Bennett, Jr. and I. Estermann. Carnegie Institute of Technology. Dept. of Physics. May 1953. 166p photos, drawings, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $6.25, Photostat $21.25. PB 113095

Measurements were made of the distribution of velocities in molecular beam of potassium atoms as a function of oven pressure for two types of oven slits. The measurements confirm previous observations that the proportion of slow molecules in the beam is considerably less than that expected for a Maxwellian distribution, and that this deficiency increases with increasing oven pressure. Methods used to correct the experimental results for the finite width of the selector slots are described. Contract N7onr-303, Task order 3, Project NR019-602. Technical report no. 4. Based on a thesis submitted by A. I. Bennett to the College of Engineering and Science, Carnegie Institute of Technology.

Meridional transport of kinetic energy in the atmosphere, by Shih-Kung Kao. Johns Hopkins University. Dept. of Civil Engineering, Baltimore, Md. Oct 1953. 49p diagrs, graphs, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 113002

Contract AF 19(122)-365. Scientific report no. 2.
1. Kinetic theory 2. Vortex motion - Theory 3. Energy, Kinetic.

Scattering operator in quantum mechanics. Part I. The properties of the scattering operator from the time-dependant Schroedinger equation, by H. E. Moses. New York University. Institute of Mathematical Sciences. Division of Electromagnetic Research. 1953. 44p Available from Library of Congress, Publication Board Project, Washington

25, D. C. Microfilm $2.50, Photostat $6.25.
PB 113011

Contract no. AF 19(122)-463.
1. Equations, Integral 2. Quantum mechanics 3. Schrodinger equation (Particle interactions) 4. Particles - Distribution - Mathematical analysis 5. Mathematical equations and solutions 6. NYU RR CX-12.

Nuclear

Natural radiocarbon 14 measurement and applications. Quarterly progress report no. 2 under Contract no. AF 19(122)-214, by J. Laurence Kulp. Columbia University. Lamont Geological Observatory, Palisades, New York. Oct 1950. 30p photos, drawings (1 fold), fold diagrs, tables Microfilm $2.00, Photostat $3.75.
PB 112432

For reports no. 1, 3, 6, 8, 9/11, 13/14 see PB 112431, 112433-112435, 109130, 112476. Appendix A: Preliminary report on cruise A-164, by Maurice Ewing.
1. Carbon - Isotopes - Tracer technique 2. Radiocarbon - Measurement 3. Counters, Electronic - Design 4. Geiger counters - Design 5. Sea water - Carbon dioxide content.

Shadow shields, by E. I. Nowstrup, L. A. Beach and W. R. Faust. U. S. Naval Research Laboratory. Nov 1953. 5p drawing, graphs Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. Mimeo: $.50.
PB 111272

Studies have been made of the effectiveness of shadow shields placed between a source and detector. Experiments were performed by observing counting rates with a Geiger tube at various distances in water from a source hidden behind conical lead shadow shields of various dimensions. NRL R 4275.

Symposium on "Utilization of radiation from fission products" held at Harwell on 23rd and 24th February 1953, an A.E.R.E. report, edited by G. N. Walton and J. Wright. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Jun 1953. 154p diagr, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $4.50. PB 112808

HD. 957. S. O. code no. 70-674-1-56. Contents: 1. Introduction to the symposium, by R. Spence. - 2. Use of the gamma radiation from reactor fuel rods, by W. Wild and J. Wright. - 3. Use of the radiation from fission product wastes, by C. B. Amphlett. - 4. The specific activity of separated fission products from reactor fuels, by G. N. Walton. - Paper 4, Appendix I. Elements formed in 100 grams of U235 undergoing fission - Paper 4, Appendix II. Continuous use of long-lived separated products. Paper 4, Appendix III. Continuous use of rare gas fission products. - Paper 4, Appendix IV. Optimum hold-up time for the utilization of power from separated fission products. - 5. The separation of long-lived fission products, by P. E. Carter. - 6. Technical feasibility of the use of fission products - Part 1, by M. W. Perrin. - Part II. Ethylene polymerisation. Initiation by gamma rays, by L. Seed. - 7. Economic feasibility of the use of fission products, compiled by J. W. Barrett, B. L. Budd, R. Roberts and D. S. P. Roebuck. - 8. Preservation of food, by R. S. Hannan. - 9. Sterilization of pharmaceutical products, by W. Jones. - 10. High energy radiation and long chain polymers, by A. Charlesby. - 11. The effects of ionizing radiation on organic high polymers, by K. Little. - 12. Introductory talk on the uses of radiation in medicine, by W. V. Mayneord. - 13. Methods of mounting separated fission products safely for industrial and medical use, by W. P. Grove. - 14. Casesium 137 and its use, by W. S. Eastwood. - 15. Suggestions for future action arising from the symposium. - 16. List of those taking part in the discussions. 17. Bibliography of fission product utilization covering the period 1945 to April 1953, compiled by Mrs. O. T. Davidge. - 18. Units and conversion factors.
1. Fission products - Uses - Gt. Brit. 2. Waste, Radioactive - Uses - Gt. Brit. 3. Gamma rays - Fission products - Gt. Brit. 4. Uranium - Fission products - Gt. Brit. 5. Fission products, Long-lived - Separation - Gt. Brit. 6. Food - Preservation - Effects of radiation - Gt. Brit. 7. Pharmaceuticals - Sterilization - Effects of radiation - Gt. Brit. 8. Polymers, Long chain - Radiation - Gt. Brit. 9. Polymers, High - Ionization - Gt. Brit. 10. Radiation - Medical effects - Gt. Brit. 11. Fission products - Mounting - Gt. Brit. 12. Fission products - Industrial uses - Gt. Brit. 13. Cesium - Isotopes - Therapeutic uses - Gt. Brit. 14. Atomic power - Research - Gt. Brit. 15. AERE C/R 1231.

RUBBER AND RUBBER PRODUCTS

Infrared polarization spectra and structure of hevea and gutta elastomers, by R. A. Saunders and D. C. Smith. U. S. Naval Research Laboratory. Nov 1948. 17p diagrs, fold graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 113034

The infrared absorption spectra of oriented crystalline films of natural (hevea) rubber and of guttapercha in both the α and β forms have been determined over the range 2-15 μ using polarized radiation. The observed dichroic effects lead directly to the conclusion that hevea- and gutta-type elastomers have the structure of "cis" and "trans" polyisoprene, respectively. NRL R3382.

Research investigations leading to the development of improved butyl rubber compounds. Quarterly report no. 1 for quarter ending May 31, 1951 under Contract no. DA 36-039-sc-5436, by L. J. Radi, N. G. Britt and B. Schwartz. Interchemical Corporation. Research Laboratories, New York, N. Y. Jun 1951. 35p photos, graphs, tables

Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 113014

Project no. 1211. Signal Corps project no. 32-2005-33 (CO36420.2).
1. Rubber, Butyl - Production 2. Rubber, Synthetic - Production 3. Propene, 2-Methyl - Polymers 4. Polymers - Testing 5. Polymers - Properties 6. Rubber compounds - Production 7. SIG Contract DA36-039-sc-5436 Quarterly report no. 1.

STRUCTURAL ENGINEERING

Analysis of thin square plates under normal pressure and provided with edge frames of finite stiffnesses in the plane of the plates, by Sigge Eggwertz and Artur Norr. Flygtekniska Försöksanstalten (FFA) Stockholm. 1953. 35p photos, diagrs, graphs, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 113083

1. Plates, Stiffened - Stress analysis - Sweden
2. Plates, Stiffened - Plastic deformation - Sweden
3. Membrane theory - Sweden 4. FFA 50.

Comparative efficiency in bending of structural elements of various designs and solidity, by George Gerard. New York University. College of Engineering. Apr 1952. 86p diagrs, graphs (part fold), tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.75, Photostat $11.25. PB 113070

A considerable portion of this investigation is concerned with an analysis leading to the optimum design of the various elements under specified loading conditions. These analyses specify the optimum rib, post, frame or web spacing for the types of construction and also the optimum core properties for various types of sandwich construction under bending loads. The optimum type of each construction is compared. The results are discussed in terms of torsional strength or rigidity requirements, shear strength requirements and other factors. Contract no. N6-onr-279, Task order V.

Creep bending and buckling of nonlinearly viscoelastic columns, by Joseph Kempner. U. S. National Advisory Committee for Aeronautics. Jan 1954. 27p diagrs, graphs, tables Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 112928

Differential equations of bending of an idealized H-section beam column were derived for a nonlinearly viscoelastic material whose mechanical properties are analogous to a model consisting of a linear spring in series with a nonlinear dashpot whose strain rate is proportional to a power of the applied stress. The equations were used to obtain the creep-bending deflections of a beam in pure bending and of a column with initial sinusoidal deviation from straightness. PIB 200. NACA TN 3137.

Data on the compressive strength of skin-stringer panels of various materials, by Norris F. Dow, William A. Hickman and B. Walter Rosen. U. S. National Advisory Committee for Aeronautics. 49p photo, diagr, graphs, tables Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 112870

Flat skin-stringer compression panels of stainless steel, mild steel, titanium, copper, four aluminum alloys, and a magnesium alloy were tested. The results show the effect of variations in yield stress, Young's modulus, and both yield stress and Young's modulus for constant yield strain on the buckling, and load-shortening characteristics of the panels. NACA TN 3064.

Effect of small initial irregularities on the stresses in cylindrical shells, by T. S. Wu, L. E. Goodman and N. M. Newmark. Illinois. University. Dept. of Civil Engineering, Urbana, Ill. Apr 1953. 119p diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.75, Photostat $15.00. PB 112861

Civil engineering studies, structural research series no. 50. Contract N6ori-071(06), Task order VI, Project NR-064-183.
1. Shells (Aircraft) - Cylindrical - Buckling
2. Shells (Aircraft) - Cylindrical - Stress analysis
3. Deformation - Theory.

Elastic buckling under combined stresses of flat plates with integral waffle-like stiffening, by Norris F. Dow, L. Ross Levin and J. L. Troutman. U. S. National Advisory Committee for Aeronautics. Jan 1954. 19p photos, diagr, graphs, tables Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 112869

Theory and experiment were compared and found in good agreement for the elastic buckling under combined stresses of long flat plates with integral waffle-like stiffening in a variety of configurations. For such flat plates, 45° waffle stiffening was found to be the most effective of the configurations for the proportions considered over the widest range of combinations of compression and shear. NACA TN 3059.

Investigation of sandwich construction under lateral and axial loads, by Wilhelmina D. Kroll, Leonard Mordfin and William A. Garland. U. S. National Advisory Committee for Aeronautics. Dec 1953. 58p photos, diagrs, graphs, tables Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 112872

Tests under combined axial load and lateral pressure were made of sandwich panels with simply supported loaded edges and free unloaded edges to determine the strength of panels of various thicknesses and to compare the results with computed

values. The theory, is based on the theory for buckling of simply supported sandwich columns and was conservative in predicting larger strains or deflections than those measured. NACA TN 3090.

Preparation of plans for buildings, instrumentation, operation and maintenance; development, fabrication, construction and/or purchase of optical components, accessories, scout coronagraphs, materials, and devices in connection with the establishment of a solar observatory in the area near Alamogordo, New Mexico. Report of progress IV under Contract no. W-19-122-ac-17, for period 1 Feb 1949 to 1 May 1949, by Walter Orr Roberts. Harvard University. High Altitude Observatory, Boulder, Colo. May 1949. 26p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 113124

1. Solar observatories 2. Solar observatories - Equipment.

Substitute-stringer approach for including shear-lag effects in box-beam vibrations, by William W. Davenport and Edwin T. Kruszewski. U. S. National Advisory Committee for Aeronautics. Jan 1954. 23p drawings, graphs, tables Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 113020

The use of the substitute-stringer approach for including shear-lag in the calculation of transverse modes and frequencies of box beams is discussed. Various thin-walled hollow rectangular beams of uniform wall thickness are idealized by means of the substitute-stringer approach and the resulting frequencies of the idealized structures are compared with those of the original beams. The results indicate how the substitute-stringer idealization could be made in order to yield accurate representation of the shear-lag effect in dynamic analysis. NACA TN 3158.

Time-dependent buckling of a uniformly heated column, by Nathan Ness. U. S. National Advisory Committee for Aeronautics. Jan 1954. 18p diagr, graph Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 112930

A theoretical investigation is presented of the time-temperature- dependent buckling of a pin-jointed constant-section column, whose initial curvature is defined by a half-sine wave when the material is linearly viscoelastic and is heated uniformly along the column at a prescribed time rate. NACA TN 3139.

TRANSPORTATION EQUIPMENT

Aeronautics

Aircraft

Ames 10- by 14-inch supersonic wind tunnel, by A. J. Eggers, Jr. and George J. Nothwang. U. S. National Advisory Committee for Aeronautics. Jan 1954. 43p photos, drawings, graphs Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 113015

1. Mach number - Effect 2. Reynolds number - Effect 3. Wind tunnels, Supersonic - Nozzles - Design 4. Flow, Supersonic - Pressure distribution 5. U. S. Ames Aeronautical Laboratory, Moffett Field, Calif. 8. NACA TN 3095.

Analysis of multicell delta wings on Cal-Tech analog computers, by Richard H. MacNeal and Stanley U. Benscoter. U. S. National Advisory Committee for Aeronautics. Dec 1953. 84p diagrs, graphs, tables Available from National Advisory Committee for Aeronautics, 1724 'F" St., N. W., Washington 25, D. C. PB 112874

1. Wings, Triangular - Stress analysis 2. Wings, Triangular - Vibration - Calculation 3. Wings, Triangular - Deflection - Calculation 4. Computers, Analog - Uses 5. California Institute of Technology, Pasadena, Calif. 6. NACA TN 3114.

Analysis of sweptback wings on Cal-Tech analog computers, by Richard H. MacNeal and Stanley U. Benscoter. U. S. National Advisory Committee for Aeronautics. Jan 1954. 80p diagrs, graphs, tables Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 113017

1. Wings, Sweptback - Vibration - Calculations 2. Wings, Sweptback - Flutter - Calculations 3. Beams, Structural - Bending moment 4. Loads, Structural - Bending 5. California Institute of Technology, Pasadena, Calif. 6. NACA TN 3115.

Correlations involving pressure fluctuations in homogeneous turbulence, by Mahinder S. Uberoi. U. S. National Advisory Committee for Aeronautics

Jan 1954. 61p diagrs, graphs, tables Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 112875

1. Flow, Turbulent - Theory 2. Flow, Incompressible - Theory 3. Turbulence, Isotropic 4. Static pressure 5. Johns Hopkins University, Baltimore, Md. 6. NACA TN 3116.

Das ebene problem des schlagenden flugels (Plane problem of the flapping wing), by Walter Birnbaum. Translated by Mary L. Mahler. Jan 1954. 38p drawings, diagr, graphs, table Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 112864

Translated from Zeitschrift für angewandte mathematik und mechanik, vol. 4, no. 4, p. 277-292, Aug 1924.
1. Vortex motion - Theory - Germany 2. Flow, Incompressible - Theory - Germany 3. Wings - Flutter - Calculations - Germany 4. U. S. National Advisory Committee for Aeronautics 5. NACA TM 1364.

Determination of the external contour of a body of revolution with a central duct so as to give minimum drag in supersonic flow, with various perimetral conditions imposed upon the missile geometry, by Carlo Ferrari. Cornell Aeronautical Laboratory, Inc., Buffalo, N. Y. Mar 1953. 68p diagrs, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.00, Photostat $8.75. PB 112843

Formulae and processes are presented for determining the best shape for the external surface of an annular duct in order to produce a minimum amount of wave drag in supersonic flow. Contract no. N6ori-119, T. O. IV. CAL AF-814-A-1.

Experimental determination of the effect of horizontal-tail size, tail length, and vertical location on low-speed static longitudinal stability and damping in pitch of a model having 45° sweptback wing and tail surfaces, by Jacob H. Lichtenstein. U. S. National Advisory Committee for Aeronautics. 1952. 24p photos, drawings, graphs, tables Available from Superintendent of Documents, Government Printing Office, Washington 25, D. C. $.25. PB 112919

Supersedes NACA TN 2381 (PB 104311) and NACA TN 2382 (PB 104310).
1. Wings, Sweptback - Aspect ratio 2. Tail surfaces - Aerodynamics 3. Stability, Longitudinal - Effect of tail 4. Damping derivatives - Stability 5. U. S. Langley Aeronautical Laboratory, Langley Field, Va. 6. NACA 1096.

Experimental investigation of two-dimensional tunnel-wall interference at high subsonic speeds, by Earl D. Knechtel. U. S. National Advisory Committee for Aeronautics. Dec 1953. 13p diagrs Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 112871

1. Flow, Subsonic 2. Mach number - Effect 3. Reynolds number - Effect 4. Wind tunnels - Walls - Effects 5. U. S. Ames Aeronautical Laboratory, Moffett Field, Calif. 6. NACA TN 3087.

Informal observations on airplane maintenance problems in Strategic Air Command, by Eleroy L. Stromberg, Joseph Dorton, Harold Kerber. Western Reserve University. Personnel Research Institute. Sep 1950. 8p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 113149

Contract AF 33(038)-10524.
1. Airplanes - Maintenance and repair 2. Mechanics, Aeronautical 3. Psychology, Applied 4. AAF HRRL R15.

Interim report on V-g records on helicopters, by H. I. Birds. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Mar 1949. 5p photos, diagrs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.50. PB 112854

Cover date is 1953. S. O. code no. 23-2746.
1. Helicopters - Performance - Tests - Gt. Brit. 2. Helicopters - Speed - Records - Gt. Brit. 3. Recorders, Acceleration - Gt. Brit. 4. ARC RM 2746.

Investigation of mutual interference effects of several vertical-tail-fuselage configurations in sideslip, by William H. Michael, Jr. U. S. National Advisory Committee for Aeronautics. Jan 1954. 35p photos, drawings, diagrs, graphs, tables Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 113019

1. Airplanes - Sideslip - Tests 2. Stabilizers, Vertical - Interference 3. Wings - Interference 4. Fuselages - Interference 5. Interference, Nacelle 6. Canopies, Engine - Aerodynamics 7. Stability, Lateral - Dynamic tests 8. Stability, Directional - Dynamic tests 9. U. S. Langley Aeronautical Laboratory, Langley Field, Va. 10. NACA TN 3135.

Measurement of heat transfer and skin friction at supersonic speeds. Part III: Measurements of overall heat transfer and of the associated boundary layers on a flat plate at $M_1 = 2.43$, by R. J. Monaghan and J. R. Cooke. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Sep 1953. 64p photos, drawings, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $2.75. PB 112850

S. O. code no. 23-9007-39. For Parts I-II see PB 106062, 106257.
1. Airplanes - Skin - Friction - Gt. Brit. 2. Heat - Transference - Gt. Brit. 3. Mach number - Effect - Gt. Brit. 4. Boundary layer, Laminar - Thermodynamics - Gt. Brit. 5. Plates, Flat - Boundary layer - Gt. Brit. 6. Flow, Supersonic - Theory - Gt. Brit. 7. ARC CP 139.

Method for calculation of compressible laminar boundary layer with axial pressure gradient and heat transfer, by Paul A. Libby and Morris Morduchow. U. S. National Advisory Committee for Aeronautics. Jan 1954. 44p graphs Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 112878

1. Boundary layer, Laminar - Flow - Pressure gradients 2. Boundary layer, Laminar - Theory 3. Boundary layer, Laminar - Compressibility 4. Heat - Transference - Aerodynamics 5. Polytechnic Institute of Brooklyn, Brooklyn, N. Y. 6. NACA TN 3157.

Nekotorye voprosy mashushchego kryla (Some problems of the oscillating airfoil), by Y. E. Polonsky. Translated by Irville C. Lecompte, edited by F. A. Raven. May 1952. 26p photos, diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 112935t

Translated from Academy of Sciences of the Soviet Union, Institute of Mechanics. Engineering collection, vol. VIII, 1950, p. 49-60.
1. Airfoils, Oscillating - Flow patterns - Russia 2. Vortex motion - Theory - Russia 3. NAVSHIPS T470 4. STS 132.

Photographic method for determining vertical velocities of aircraft immediately prior to landing, by Emanuel Rind. U. S. National Advisory Committee for Aeronautics. Jan 1954. 23p photos, diagrs, graphs, tables Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 112929

1. Airplanes - Landing - Photographic interpretation 2. Loads, Landing - Impact - Photographic interpretation 3. Landing approach - Photographic interpretation 4. Velocity - Measurements 5. U. S. Langley Aeronautical Laboratory, Langley Field, Va. 6. NACA TN 3050.

Research on ground accident report forms in the USAF, by James W. Campbell, Ruth A. Pedersen, Marion W. Richardson. Richardson, Bellows, Henry & Co., Inc., New York, N. Y. Jun 1950. 35p diagr, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 113145

Contract AF 33(038)-10414.
1. Accidents - Report forms 2. AAF HRRL R13.

Tests on a Whirlwind aircraft in the Royal Aircraft Establishment 24-ft wind tunnel, by T. V. Somerville, R. R. Duddy, and G. H. L. Buxton. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Jun 1940. 17p diagrs, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.25. PB 112857

Cover date is 1953. S. O. code no. 23-2603.
1. Airplanes - Wind tunnel tests - Gt. Brit. 2. Airplanes - Drag - Measurement - Gt. Brit. 3. Whirlwind (Airplane) 4. ARC RM 2603.

Theoretical and experimental investigations of interference effects of delta wing-vertical tail combinations with yaw, by Willi Jacobs. Flygtekniska Försöksanstalten (FFA) Stockholm. 1953. 35p drawing, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 113082

1. Wings, Triangular - Interference - Sweden 2. Tail surfaces - Interference - Sweden 3. Interference, Aerodynamic - Sweden 4. FFA 49.

Theory of aerofoils with hinged flaps in two-dimensional compressible flow, by L. C. Woods. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Aug 1952. 32p diagrs, graphs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.90. PB 112849

S. O. code no. 23-9007-38. Cover date is 1953.
1. Airfoil theory - Gt. Brit. 2. Flow, Compressible - Theory - Gt. Brit. 4. Flaps, Aircraft - Controls - Theory - Gt. Brit. 5. ARC CP 138.

Transient temperature distributions in simple conducting bodies steadily heated through a laminar boundary layer, by Hermon M. Parker. U. S. National Advisory Committee for Aeronautics. Dec 1953. 42p graphs Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 112868

1. Boundary layer, Laminar - Thermodynamics 2. Thermal conductivity - Theory 3. Flow, Compressible - Theory 4. U. S. Langley Aeronautical Laboratory, Langley Field, Va. 5. NACA TN 3058.

Vibrations of a swept wing, by N. S. Heaps. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Apr 1952. 26p diagrs, graphs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.25. PB 112851

Cover date is 1953. S. O. code no. 23-9007-41.
1. Wings, Swept - Vibration - Theory - Gt. Brit. 2. Torsion - Theory - Gt. Brit. 3. Wings, Swept - Reinforcements - Gt. Brit. 4. Wings, Swept - Root sections - Gt. Brit. 5. ARC CP 141.

ATOMIC ENERGY COMMISSION PUBLICATIONS

The publications listed below are available from the Office of Technical Services, Washington 25, D. C., at the prices indicated. PREPAYMENT IS REQUIRED. List titles desired on Order Blank (A). Check or money order accompanying the order should be made payable to the Treasurer of the United States.

HW-29732 "An Ionization Chamber Method for Absolute Gamma Ray Dose Measurements", by I. T. Myers. October 14, 1953. 30p. $.25.

LA-1566 "Collected Radiochemical Procedures," by Jacob Kleinberg and others. February 1, 1953. 197p. $1.25.

LA-1413 "Collision Kinetics in a Shock Wave", by T. P. Cotter. March 1952. 17p. $.25.

LRL-63 "Static Corrosion of Uranium, Zirconium and Copper by "Arochlor", by P. O. Strom. December 1953. 7p. $.10.

LRL-64 "Static Corrosion of Aluminum Alloys at 350°F and 480°F in Distilled Water", by P. O. Strom and M. H. Boyer. October 1953. 10p. $.10.

NBS-2837 "Determination of Carbon 14 in Solutions of Labeled Materials by Means of a Proportional Counter", by A. Schwebel, H. S. Isbell and J. D. Moyer. November 15, 1953. 14p. $.20.

NYO-4565 "Mixed Beta-Gamma Exposures in Film Badge Dosimetry", by Leonard R. Solon. December 1953. 7p. $.20.

NSF-tr-160 "Vibrational Spectrum of the Simplest Model of an Ordering Alloy", by A. N. Men and A. N. Orlov. 4p. Translated from Doklady Akademii Nauk SSSR, 90, 753-56 (1953). $.10.

NSF-tr-161 "Broadening of Spectrum Lines by Quadrupole Stark Effect", by I. I. Sobelman and L. A. Vainshtein. 5p. Translated from Doklady Akademii Nauk SSSR, 90, 757-60 (1953). $.10.

NSF-tr-162 "On the Theory of Strong Coupling in Meson Fields," by B. T. Geilikman. 4p. Translated from Doklady Akademii Nauk SSSR, 90, 991-94 (1953). $.10.

NSF-tr-163 "The Relative Primary and Total Ionization of μ-Mesons as a Function of Energy", by G. P. Yeliseyev, V. K. Kosmachevsky, and V. A. Lyubimov. 4p. Translated from Doklady Akademii Nauk SSSR, 90, 995-98 (1953). $.10.

NSF-tr-164 "On the Law of Damping of the Luminescence of Solid Organic Substances", by V. A. Yastrebov. 4p. Translated from Doklady Akademii Nauk SSSR, 90, 1015-18 (1953). $.10.

NSF-tr-165 "Viscous Properties of Plastic Lubricants and Rotational Resistance of Anti-Friction Bearings", by G. V. Vinogradov and M. D. Bezborodko. 4p. Translated from Doklady Akademii Nauk SSSR, 90, 1019-22 (1953). $.10.

NSF-tr-166 "Characteristic Functions of Real Resonators", by V. M. Vakhnin. 5p. Translated from Doklady Akademii Nauk SSSR, 91, 779-82 (1953). $.10.

NSF-tr-167 "Passive Radiating Systems in Wave-Guides", by M. L. Levin. 4p. Translated from Doklady Akademii Nauk SSSR, 91, 807-810 (1953). $.10.

NSF-tr-169 "Determining 0 and $\hbar/2$ Spins of Nuclei from Microwave Spectra of Molecules' , by A. M. Prokhorov and N. G. Basov. 2p. Translated from Doklady Akademii Nauk SSSR, 90, 1003-4 (1953). $.10.

NSF-tr-170 "On the Photoelastic Constant of Glass under Large Stresses", by G. M. Bartenev. 5p. Translated from Doklady Akademii Nauk SSSR, 91, 523-26 (1953). $.10.

NSF-tr-171 "Effect of Temperature on Light Absorption in Thin and Extra-Thin Layers of Silver", by A. G. Gumenyuk. 5p. Translated from Doklady Akademii Nauk SSSR, 91, 783-86 (1953). $.10.

NSF-tr-174 "Redistribution of the Intensities of Spectral Lines of Elements in a Discharge in Argon", by K. N. Mochalov and Ye. L. Raff. 4p. Translated from Doklady Akademii Nauk SSSR, 91, 1067-70 (1953). $.10.

NSF-tr-177 "Threshold of the Secondary Electron Emission of Nickel and Molybdenum", by A. R. Shulman and Ye. I. Myakinin. 4p. Translated from Doklady Akademii Nauk SSSR, 91, 1075-78 (1953). $.10.

NSF-tr-178 "Effect of the Ratio of Rubbing Surface to Hardness on Slipping Conditions of Machine Parts in Contact", by D. N. Garkunov and I. V. Kragelsky. 4p. Translated from Doklady Akademii Nauk SSSR, 91, 1085-88 (1953). $.10.

NSF-tr-180 "On the Agglomeration of Amorphous Bodies", by Ya. Ye. Geguzin. 4p. Translated from Doklady Akademii Nauk SSSR, 92, 45-48 (1953). $.10.

NSF-tr-181 "Effect of Water and Alcohol on the Grinding of Metals," by V. D. Kuznetsov, Corresponding Member of the USSR Academy of Science, and V. D. Taranenko. 4p. Translated from Doklady Akademii Nauk SSSR, 92, 49-52 (1953). $.10.

NSF-tr-182 "The Magnetic Mass-Spectrometer in Combination with a Wilson Cloud Chamber," by Corresponding Member of the USSR Academy of Science A. Alikhanyan, V. Kirillov-Ugryumov, N. Shostakovich, and V. Fedorov. 4p. Translated from Doklady Akademii Nauk SSSR, 92, 255-57 (1953). $.10.

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